



Transport
Canada

Transports
Canada

**EDMONTON OPERATIONS DIVISION
ENGINEERING
1100, 9700 JASPER AVENUE, NW
EDMONTON AB T5J 4E6 #31**

Transport Canada
1100 - 9700 Jasper Avenue
Canada Place
Edmonton AB T5J 4E6



PB031 1924061
002742 8<y>x7
0812 140949



**Attn.: Mr. Jeff Clarke
Aero Design Ltd.
9888A Malaspina Road
POWELL RIVER BC CANADA V8Z 0G3**

Canada

**PLEASE USE ROUTING SYMBOL ON ALL
CORRESPONDENCE**

**PRIÈRE D'INDIQUER VOTRE SYMBOLE
D'ACHEMINEMENT SUR TOUTE CORRESPONDANCE**

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United States of America
Department of Transportation
Federal Aviation Administration

Supplemental Type Certificate
IMPORT

Number: SR03317NY

This certificate issued to: Aero Design Ltd.
9888A Malaspina Road
Powell River, British Columbia V8A 0G3
Canada

certifies that the change in the type design for the following product with the limitations and conditions therefore as specified hereon meets the airworthiness requirements of Part 27 of the Federal Aviation Regulations.

Original Product – Type Certificate Number:
R00003RD

Make: Bell Helicopter Textron Canada Limited
Model: 429

Description of Type Design Change:

1. Configuration 1: Fixed Cabin Step Installation on one side of the aircraft and Quick Release Cargo Basket Installation on the opposite side.
2. Configuration 2: Fixed Cabin Step Installation on one side of the aircraft and Quick Release Cabin Step Installation on the opposite side.

(See Description of Type Design Change continue on Page 3 of 3)

Limitations and Conditions:

1. Modifications to the Quick Release Cargo Basket are eligible in accordance with Aero Design Ltd. Document Control List DCL704-429 Revision 1, dated September 12, 2014, Transport Canada approved December 3, 2014 or later approved revision.
2. The installer must determine whether this design change is compatible with previously approved modifications.
3. If the holder agrees to permit another person to use this certificate to alter the product, the holder shall give the other person written evidence of that permission.

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, and revoked or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of Application: February 7, 2013

Date Reissued: March 10, 2015

Date of Issuance: September 24, 2013

Date Amended: July 15, 2015

By Direction of the Administrator

Signature

Title

Gaetano Sciortino
Manager, New York
Aircraft Certification Office

Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both. This certificate may be transferred or made available to third persons by licensing agreements in accordance with 14 CFR 21.47. Possession of this Supplemental Type Certificate (STC) document by persons other than the STC holder does not constitute rights to the design data nor to alter an aircraft, aircraft engine, or propeller. The STC's supporting documentation (drawings, instructions, specifications, flight manual supplements, etc.) is the property of the STC holder. An STC holder who allows a person to use the STC to alter an aircraft, aircraft engine, or propeller must provide that person with written permission acceptable to the FAA. (Ref. 14 CFR 21.120).



United States of America
Department of Transportation
Federal Aviation Administration

Supplemental Type Certificate

(Continuation Sheet)

Number: SR03317NY

Date Amended: July 15, 2015

Description of Type Design Change (continued):

3. Installation of Quick Release Cargo Basket in accordance with Aero Design Ltd. Installation Drawing 95901 Revision 1 for S/N 57001 - 57080, or Installation Drawing 95905 Revision 0 for S/N 57081 & Sub., per Aero Design Ltd. Document Control List DCL959-1 Revision 2, dated September 12, 2014, Transport Canada approved December 3, 2014, or later Transport Canada approved revision.
4. Installation of Fixed Cabin Step in accordance with Aero Design Ltd. Installation Drawing 96901 Revision 1 for S/N 57001 - 57080, or Installation Drawing 96905 Revision 0 for S/N 57081 & Sub., per Aero Design Ltd. Document Control List DCL969-1 Revision 2, dated September 12, 2014, Transport Canada approved December 3, 2014, or later Transport Canada approved revision.
5. Installation of Quick Release Cabin Step in accordance with Aero Design Ltd. Installation Drawing 96902 Revision 1 for S/N 57001 - 57080, or Installation Drawing 96906 Revision 0 for S/N 57081 & Sub., per Aero Design Ltd. Document Control List DCL969-1 Revision 2, dated December 12, 2014, Transport Canada approved December 3, 2014, or later Transport Canada approved revision.
6. Aero Design Ltd. Rotorcraft Flight Manual Supplement No. FMS959.90 Revision 2, dated September 15, 2014, Transport Canada approved December 3, 2014, or later Transport Canada approved revision is required for Quick Release Cargo Basket installation.
7. Aero Design Ltd. Rotorcraft Flight Manual Supplement No. FMS969.90 Revision 2, dated September 15, 2014, Transport Canada approved December 3, 2014, or later Transport Canada approved revisions is required for Fixed and Quick Release Cabin Step installations.
8. Aero Design Ltd. Instructions for Continued Airworthiness ICA959.91 Revision 1, dated September 4, 2014, Transport Canada accepted December 3, 2014, or later Transport Canada accepted revision is required for Quick Release Cargo Basket installation.
9. Aero Design Ltd. Instructions for Continued Airworthiness ICA969.91 Revision 1, dated May 8, 2014, Transport Canada accepted December 3, 2014, or later Transport Canada accepted revision is required for Fixed and Quick Release Cabin Step Installations.

-----END-----

Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both. This certificate may be transferred or made available to third persons by licensing agreements in accordance with 14 CFR 21.47. Possession of this Supplemental Type Certificate (STC) document by persons other than the STC holder does not constitute rights to the design data nor to alter an aircraft, aircraft engine, or propeller. The STC's supporting documentation (drawings, instructions, specifications, flight manual supplements, etc.) is the property of the STC holder. An STC holder who allows a person to use the STC to alter an aircraft, aircraft engine, or propeller must provide that person with written permission acceptable to the FAA. (Ref. 14 CFR 21.120).



U.S. Department
of Transportation
**Federal Aviation
Administration**

Engine & Propeller Directorate

New York Aircraft Certification Office
1600 Stewart Avenue
4th Floor, Suite 410
Westbury, NY 11590
(516) 228-7300, Fax: (516) 794-5531

JUL 28 2015

Mr. Jack Staal
Aeronautical Engineering Technologist
Aircraft Certification
Transport Canada Civil Aviation (TCCA)
1100-9700 Jasper Avenue
Edmonton, Alberta T5J 4E6
Canada

C-15-0024



Subject: Amendment to Supplemental Type Certificate (STC) SR03317NY

Dear Mr. Staal:

In recognition of the TCCA Supplemental Type Certificate SH12-58 Issue No. 3, dated December 3, 2014 Installation of Fixed Cabin Step with Quick Release Cargo Basket or Quick Release Cabin Step on Bell 429 model aircraft to address the installation on later serial number aircraft which have different attachment provisions, and the existing Bilateral Aviation Safety Agreement (BASA) Implementation Procedures for Airworthiness between the United States and Canada, we are pleased to accept the TCCA Statement of Compliance that compliance has been demonstrated with the FAA Type Certificate R00003RD, and therefore we have reissued the FAA Supplemental Type Certificate (STC) SR03317NY on March 10, 2015 for the change of the holder's address, and amended on July 15, 2015 to incorporate the latest revisions of the applicable Master Document Lists to Aero Design Ltd. The NAPA Project Number is C-15-0024 and the corresponding FAA Project Number is SA07979NY-R.

*Letter, Cert. & Resp.
all uploaded
to NAPA.*

All mandatory inspections/modifications and related service bulletins issued in the future against this STC model must be forwarded to the following:

Federal Aviation Administration
Airworthiness Programs Branch, AIR-140
PO Box 26460
Oklahoma, City, OK 73125
USA

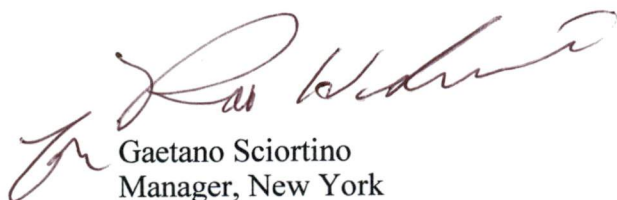
Telephone: 405-954-4103
Facsimile: 405-954-4104

In accordance with the US/Canada bilateral relationship using TCCA compliance to the maximum extent, this STC includes reference to documents that include the words "or later Transport Canada approved/accepted revision." It is expected that as State of Design responsible for the STC, TCCA will coordinate any major/significant changes, as deemed appropriate, with the FAA prior to TCCA approval acceptance.

Please forward the enclosed STC and copy of "Information Concerning Your Responsibility as a Holder of A Supplemental Type Certificate, Issued to a Canadian Applicant" to Aero Design Ltd. A copy of the STC and required documents must accompany each installation. Also, your attention is directed to the limitations and conditions specified in the STC.

If you have any questions or require additional information, please contact Mr. Leung Lee by telephone at 1-516-228-7309 or by facsimile at 1-516-794-5531.

Sincerely,

A handwritten signature in dark ink, appearing to read "Gaetano Sciortino", is written over the typed name.

Gaetano Sciortino
Manager, New York
Aircraft Certification Office

2 Enclosures

**NEW ENGLAND REGION
NEW YORK AIRCRAFT CERTIFICATION OFFICE
1600 STEWART AVENUE, SUITE 410
WESTBURY, NEW YORK 11590**

**INFORMATION CONCERNING YOUR RESPONSIBILITY AS HOLDER OF A
SUPPLEMENTAL TYPE CERTIFICATE ISSUED TO A CANADIAN APPLICANT**

This STC is official indications of FAA approval of your installation and may be used to authorize identical installation on other aircraft of the same model, subject to the limitation noted in the STC. It may be transferred, or otherwise made available to another party by means of a licensee arrangement; however, you are requested to advise this office when you transfer or grant licensee rights to the STC in order that we may take the necessary recording or reissuance action.

If you plan to manufacture and sell parts for installation on type certificated aircraft, please review FAR 21.502, which is applicable to parts imported into the U.S.

A copy of the STC and required documents should accompany each kit and installation. Also, your attention is directed to the limitations and conditions specified in the STC.

As recipient of this approval, except as provided in FAR21.3(d), you are required to report any failure, malfunction, or defect in any product or part manufactured by you that you have determined has resulted or could result in any of the occurrences listed in FAR 21.3(c).

The report should be communicated initially by telephone and subsequently in writing to the Manager, New York Aircraft Certification Office, telephone (516) 228-7300, mailing address: 1600 Stewart Avenue, Suite 410, Westbury, New York 11590. This first contact should take place within 24 hours after it has been determined that the failure required to be reported has occurred.

FAA Form 8010-4, Malfunction or Defect Report, or any other appropriate format is acceptable in transmitting the required details.

A handwritten signature in dark ink, appearing to read 'Gaetano Sciortino', is written over a horizontal line.

Gaetano Sciortino
Manager
New York Aircraft Certification Office



Transport
Canada

Transports
Canada

1100-9700 Jasper Avenue, N.W.
Edmonton AB T5J 4E6
www.tc.gc.ca

Your file Votre référence

Tuesday, August 11, 2015

Our file Notre référence

C-15-0024
SR03317NY

Aero Design Ltd.
9888A Malaspina Road
Powell River, British Columbia
Canada, V8A 0G3

SUBJECT:	Approval of	Installation of External Attachment Provisions,
		Cargo Basket, and Cabin Steps
	FAA STC:	SR03317NY
	Aircraft:	Bell 429
	FAA STC Holder:	Aero Design Ltd.

Enclosed is the original FAA Supplemental Type Certificate and information concerning your responsibility as a holder of a Supplemental Type Certificate issued to a Canadian Applicant.

Yours truly,

Certification Technologist
Prairie and Northern Region
Phone: 780-495-5227
E-Mail: Jack.Staal@tc.gc.ca

Encl.

SUPPLEMENTAL TYPE CERTIFICATE

10043360, REV. 2

This Supplemental Type Certificate is issued by EASA, acting in accordance with Regulation (EC) No. 216/2008 on behalf of the European Community, its Member States and of the European third countries that participate in the activities of EASA under Article 66 of that Regulation and in accordance with Commission Regulation (EU) No. 748/2012 to

AERO DESIGN LTD.

**9888A MALASPINA ROAD
POWELL RIVER BC V8A 0G3
CANADA**

and certifies that the change in the type design for the product listed below with the limitations and conditions specified meets the applicable Type Certification Basis and environmental protection requirements when operated within the conditions and limitations specified below:

Original Type Certificate Number : EASA.IM.R.506

Type Certificate Holder : BELL HELICOPTER TEXTRON CANADA

Type Design - Model : 429

Original STC Number : TCCA SH12-58 ISSUE 3

Description of Design Change:

INSTALLATION OF EXTERNAL ATTACHMENT PROVISIONS, CARGO BASKET AND CABIN STEPS

CONFIGURATION A - External Attachment Provisions Only: Installation as defined in DCL959-2.

CONFIGURATION B - External Cargo Basket: Installation as defined in DCL959-1 and modifications eligible in accordance with DCL704-429.

CONFIGURATION C - Cabin Steps: Installation as defined in DCL969-1.

Revision 2 of this STC, following TCCA STC No. SH12-58 Issue 3, includes adaptations to the changed fuselage design in rotorcraft S/N 57081 and subsequent, introduction of limitations/conditions for the installation of cabin steps and modifications to the cargo basket design.

See Continuation Sheet(s)

For the European Aviation Safety Agency,

Date of issue: 13 May 2015


Massimo MAZZOLETTI
Head of Rotorcraft Department

Note:

The following numbers are listed on the certificate:
EASA current Project Number: 0010020992-001

SUPPLEMENTAL TYPE CERTIFICATE - 10043360, REV. 2 - AERO DESIGN LTD.

TE.STC.00091-003 - Copyright European Aviation Safety Agency. All rights reserved.

EASA Certification Basis:

The Certification Basis for the original product remains applicable to this certificate/ approval.
The requirements for environmental protection and the associated certified noise and/ or emissions levels of the original product are unchanged and remain applicable to this certificate/ approval.

Associated Technical Documentation:**CONFIGURATION A:**

- Aero Design Ltd. Document Control List, DCL959-2, Rev. 2, dated 12 September 2014

CONFIGURATION B:

- Aero Design Ltd. Document Control List, DCL959-1, Rev. 2, dated 12 September 2014,
- Aero Design Ltd. Document Control List, DCL704-429, Rev. 1, dated 12 September 2014

CONFIGURATIONS A AND B:

- Aero Design Ltd. Flight Manual Supplement FMS959.90, Rev. 2, dated 15 September 2014
- Aero Design Ltd. Instructions for Continued Airworthiness ICA959.91, Rev. 1, dated 4 September 2014

CONFIGURATION C:

- Aero Design Ltd. Document Control List, DCL969-1, Rev. 2, dated 12 September 2014
- Aero Design Ltd. Flight Manual Supplement FMS969.90, Rev. 2, dated 15 September 2014.
- Aero Design Ltd. Instructions for Continued Airworthiness ICA969.91, Rev. 1, dated 8 May 2014

or later revisions of the above listed documents approved by EASA in accordance with the Technical Implementation Procedures of EU/ Canada Bilateral Agreement.

Limitations/Conditions:

1. Installation of Configuration A, external attachment provisions, is a pre-requisite for installation of Configuration B, external cargo basket.
2. Installation of Configuration A, external attachment provisions, is a pre-requisite for installation of Configuration C, cabin steps.
3. Installation of the Fixed Cabin Step in accordance with DCL969-1 is mandatory.
4. Installation of the Quick Release Cabin Step in accordance with DCL969-1 is mandatory when the External Cargo Basket (Configuration B) is removed from the external attachment provisions (Configuration A).
5. This design change is not compatible with the installation of floats.
6. Prior to installation of this design change it must be determined that the interrelationship between this design change and any other previously installed design change and/ or repair will introduce no adverse effect upon the airworthiness of the product.

- end -

Note:

The following numbers are listed on the certificate:
EASA current Project Number: 0010020992-001

SUPPLEMENTAL TYPE CERTIFICATE - 10043360, REV. 2 - AERO DESIGN LTD.

TE.STC.00091-003 - Copyright European Aviation Safety Agency. All rights reserved.



Transport
Canada

Transports
Canada

1100 – 9700 Jasper Avenue N.W.
Edmonton, Alberta, Canada
T5J 4E6

Your file Votre référence

0010034945
Our file Notre référence

January 21, 2015

C-14-1164
SH12-58 Iss 3

European Aviation Safety Agency
Postfach 10 12 53
D-50452 Köln
Germany

Via Email: rotorcraft@easa.europa.eu

Dear Sir/Madam,

Reference: EASA project number 0010034945
 EASA STC 10043360 Rev 1
 TCCA STC SH12-58 Issue 3
 Aero Design Ltd., Attachment Provisions, Cargo Basket, and Steps
 Bell 429

We have received from Aero Design Ltd., of Powell River, British Columbia, Canada, an application to update their EASA STC 10043360 Rev 1 to the next revision level. The STC revision application includes an address update, as well as a design change, with required documentation revisions.

This design change (revision) installs the cargo basket on later serial number Bell 429 helicopters. Bell 429 serial number 57081, and later, have different fuselage attachment provisions. Aero Design Ltd Project Summary 959-1 Rev 0 has a description of the design change.

This letter addresses the EASA email of January 19, 2015 and provides additional information in accord with the current Technical Implementation Procedures Rev 1, 7 October 2013, in particular, but not limited to, paragraphs 2.6.1, 2.6.2, 2.13.1 and C2.1.2.

The design change might be considered a Major level 1 change. The EASA "Application for Approval of Major Change/Major Repair Design" form FO.CERT.00031-002 has been completed. It should be noted however that the primary change is the basket attachment details for the later serial numbers, the overall configuration has not materially changed. This revision also formalizes that a step is to be installed when the basket is removed. This is to replace the Bell step.

..continued

Canada

The Bell 429 has both TCCA and EASA Type Certifications, reference H-107 and EASA.IM.R.506.

TCCA has issued STC SH12-58 Issue 3 for this design change.

The design change is considered "not significant" under the Change Product Rule. The application date for Issue 1 of TCCA STC SH12-58 was 2012 Oct 2 . The application date for the latest TCCA reissue was 2014 Feb 20.

The TCCA STC identifies the certification basis as that specified by TCDS H-107, namely CAR 527 Change 1 (FAR27 amendment 27-44). The certification basis details for this design change are defined in Aero Design Ltd Certification Plan CP959.10 Rev 2. This certification basis had been accepted for issue of the previous revisions of the EASA STC. The basis has again been reviewed against EASA Airworthiness Requirements CS27 Change 1 and found to be much the same for the paragraphs affected by this STC revision. The EASA Environmental Standards are deemed not affected by this design update and remain applicable. TCCA has issued STC SH12-58 and finds that EASA Airworthiness Requirements CS27 Change 1, the EASA certification basis, has been met.

TCCA has not evaluated the STC for any EASA operational rules, or other National requirements.

There are no unusual design features, special conditions, exemptions, deviations, or equivalent safety findings with this STC.

The STC applicant entered into an agreement with Bell Helicopter to evaluate the fuselage interface structure. The remainder of the project was supported by a TCCA delegated Design Approval Representative and the STC holder's own resources. This arrangement is acceptable to TCCA for this STC update.

EASA financial arrangements had previously been made for the earlier EASA STC revisions. Aero Design's current (updated) contact information, for ensuring EASA terms of payment, are contained in the EASA application form section 2.2 Billing Data. Note this may be different from historical information on file as the company has moved.

While we have no defined delivery date we understand the first European customer is patiently waiting.

The following documentation is provided with this letter.

1. TCCA STC SH12-58 Issue 3
2. EASA STC 10034945 Rev 1 (for reference)
3. Application form FO.CERT.00031-002 completed (with billing details)
4. Project Summary PS959-1 Rev 0
5. Certification Plan CP959.10 Rev 2 signed
6. Document revision description listing
7. Document Control List DCL704-429 Rev 1

..continued

8. Document Control List DCL959-1 Rev 2
9. Document Control List DCL959-11 Rev 1
10. Document Control List DCL959-12 Rev 1
11. Document Control List DCL959-15 Rev 0
12. Document Control List DCL959-16 Rev 0
13. Document Control List DCL959-2 Rev 2
14. Document Control List DCL969-1 Rev 2
15. Document Control List DCL969-11 Rev 1
16. RFMS FMS959.90 Rev 2
17. RFMS FMS969.90 Rev 2
18. ICA959.91 Rev 1
19. ICA969.91 Rev 1
20. Email re flight test
21. Install drawing 95901 Rev 1
22. Install drawing 95902 Rev 1
23. Install drawing 95905 Rev 0
24. Install drawing 95906 Rev 0
25. Install drawing 95907 Rev 0
26. Install drawing 96901 Rev 1
27. Install drawing 96902 Rev 1
28. Install drawing 96905 Rev 0
29. Install drawing 96906 Rev 0
30. Bell fit check letter October 10, 2014
31. Bell Report Form re structural acceptability of the Basket on the 429.
32. MSI 53 for ICA969.91 Rev 1
33. MSI 53 for ICA959.91 Rev 1
34. Conformity Inspection Record 05/09/2014
35. Test Plan and Report TR959.04 Rev 0
36. Test Plan and Report TR959.05 Rev 0
37. EASA email January 19, 2015 (reference)

We trust this initial submission is satisfactory. With EASA agreement further detail data will be provided to the EASA project manager, or PCM, by the STC holder in accord with TIP paragraph 2.6.1(2)(g). Please advise who will be the EASA project manager, PCM, contact person, assigned to this EASA STC revision application.

Should EASA require additional information please contact the undersigned, or the STC holder:

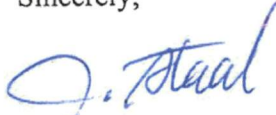
Aero Design Ltd.
9888A Malaspina Road
Powell River, BC, Canada
V8A 0G3

..continued

Jeff Clarke, P. Tech. (Eng.)
Phone: 604-483-2376
Fax: 604-483-2372
Email: jeff@aerodesign.ca

Please reference our file number C-14-1168 in future communications.

Sincerely,



J. Staal
Engineering, Edmonton Operations
Prairie and Northern Region

Phone: 780-495-5227
Fax: 780-495-6659
Email: jack.staal@tc.gc.ca

attachments



Aero Design Ltd.
9888A Malaspina Road
Powell River, BC, Canada
V8A 0G3

Tel: 604.483.2376
Fax: 604.483.2372
www.aerodesign.ca

30 December 2014

Transport Canada
Aircraft Certification Division
11th Floor, Canada Place
9700 Jasper Avenue
Edmonton, Alberta
T5J 4E6

Attn: Jack Staal

Your File :
Our File : 959

Re: Bell 429 Cargo Basket and Cabin Step Installation - FAA Application

Jack,

Please find attached the following documents in support of revision to FAA STC
SR03317NY:

Modification Approval Request Application Form		
FAA STC Application form 8110-12		
Transport Canada STC	SH12-58	Issue 3
Certification Plan	CP959.10	Rev. 2
Document Control List	DCL959-1	Rev. 2
Document Control List	DCL959-2	Rev. 2
Document Control List	DCL959-11	Rev. 1
Document Control List	DCL959-12	Rev. 1
Document Control List	DCL959-15	Rev. 0
Document Control List	DCL959-16	Rev. 0
Document Control List	DCL704-429	Rev. 1
Flight Manual Supplement	FMS959.90	Rev. 2
Instructions for Continued Airworthiness	ICA959.91	Rev. 1
MSI 53 Review for ICA959.91 Rev. 1		
Engineering Report	ER959.03	Rev. 0
Load Test Report	TR959.04	Rev. 0
Load Test Report	TR959.05	Rev. 0
Revised Drawings (for S/N 57001-57080)		
Basket Installation	95901	Rev. 1
Mounting Provisions Installation	95902	Rev. 1
Basket Assembly	95910	Rev. 1
Basket Body Assembly	95911	Rev. 1
Basket Lid Assembly	95912	Rev. 1
Forward Sheet	95915	Rev. 1
Filler Sheets	95916	Rev. 1
Lid Checker Plate	95917	Rev. 1
Forward Fitting Fabrication	95920	Rev. 1
Aft Fitting Fabrication	95921	Rev. 1



Aero Design Ltd.
9888A Malaspina Road
Powell River, BC, Canada
V8A 0G3

Tel: 604.483.2376
Fax: 604.483.2372
www.aerodesign.ca

Adapter Plates Fabrication	95922	Rev. 1
Bushings Fabrication	95923	Rev. 1
Forward Attachment Hoop	95925	Rev. 1
Aft Attachment Hoop	95926	Rev. 1
Placard Fabrication	95927	Rev. 1
Forward Beam Fabrication	95930	Rev. 1
Aft Beam Fabrication	95931	Rev. 1
New Drawings (for S/N 57081 & Sub.)		
Basket Installation	95905	Rev. 0
Mounting Provisions Installation	95906	Rev. 0
External Attachment Provisions Installation	95907	Rev. 0
Basket Assembly	95950	Rev. 0
Basket Body Assembly	95951	Rev. 0
Forward Attachment Hoop	95964	Rev. 0
Forward Sheet	95965	Rev. 0
Lug Fabrication	95940	Rev. 0
Plates	95942	Rev. 0
Forward Beam Fabrication	95932	Rev. 0
Aft Beam Fabrication	95933	Rev. 0
Cabin Steps:		
Document Control List	DCL969-1	Rev. 2
Document Control List	DCL969-11	Rev. 1
Flight Manual Supplement	FMS969.90	Rev. 2
Instructions for Continued Airworthiness	ICA969.91	Rev. 1
MSI 53 Review for ICA969.91 Rev. 1		
Drawings		
Fixed Step Installation (57001 - 57080)	96901	Rev. 1
Quick Release Step Installation (57001 - 57080)	96902	Rev. 1
Fixed Step Installation (57081 & Sub.)	96905	Rev. 0
Quick Release Step Installation (57081 & Sub.)	96906	Rev. 0
Fixed Step Assembly	96910	Rev. 1
Quick Release Step Assembly	96911	Rev. 1
Bracket Fabrication	96920	Rev. 1
Bracket Fabrication	96921	Rev. 1

Three copies of the above files are included on CDs for submission to the FAA.

Regards,

Jeff Clarke, P.Tech.(Eng.)

Encl.



DESIGN CHANGE APPROVAL APPLICATION

DEMANDE D'APPROBATION D'UNE MODIFICATION DE LA CONCEPTION

Legal name and address of applicant Nom et adresse légale du demandeur		Legal name and address of prospective holder Nom et adresse légale du titulaire éventuel		Name and address for billing purposes (if different than applicant) Nom et adresse aux fins de facturation (si différent du demandeur)	
Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada V8A 0G3		Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada V8A 0G3			
Identification of aeronautical product / Identification du produit aéronautique					
Make / Marque Bell		Model / Modèle 429	Registration / Immatriculation All eligible	Serial No. / N° du série All eligible	Part No. / N° de la pièce
Request for (check appropriate box) / Objet de la demande (Cochez les carrés selon le cas)				Type Design Examination by Foreign Authority Examen de la définition de type par autorité étrangère	
<input type="checkbox"/> STC CTS <input type="checkbox"/> STC (single serial number) CTS (numéro de série simple) <input type="checkbox"/> STC (multiple serial numbers) CTS (numéros de série multiples) <input type="checkbox"/> Type Certificate Revision Revision de certificat de type <input checked="" type="checkbox"/> Revision No. _____ Révision N° _____				<input type="checkbox"/> Repair Design Approval (RDA) Approbation de la conception de réparation (ACR) <input type="checkbox"/> Repair Design Approval - Process Repair ACR - Processus de réparation <input type="checkbox"/> Part Design Approval (PDA) Approbation de la conception de pièce (ACP)	
				<input checked="" type="checkbox"/> Application to a foreign authority is requested La demande à une autorité étrangère est demandée. <input type="checkbox"/> Type design examination of foreign change Examen de la définition de type modification étrangère Identify Identifier <u>FAA</u>	
<input type="checkbox"/> Restricted Category Type of Operation Catégorie restreinte Type d'opération					
Title and brief description of modification, repair or replacement part, including effects of changes (use additional pages if necessary). Refer to CAR 521.155(b)(i) for details. Titre et brève description de la modification, de la réparation ou de la pièce de rechange, y compris les effets des changements (utiliser des feuilles supplémentaires si nécessaire). Référez-vous à RAC 521.155(b)(i) pour des détails. Installation of mounting provisions, quick release cargo basket, cabin steps.					
Applicable Type Certificate (TC) / Certificat de type (CT) pertinent					
TC No. / N° de CT H-107		Issue No. / N° de l'édition 3		Identify State of Design / Identifier l'état de conception Canada	
The applicant is responsible for the control of product manufacture / Le demandeur est responsable du contrôle de la fabrication du produit					
<input checked="" type="checkbox"/> Yes Oui <input type="checkbox"/> No Non If no, identify who is responsible Si non, identifier qui est responsable _____					
Documentation to be submitted Documentation à soumettre					Applicant Demandeur
					Submitted Soumis
					Yes Oui
					No Non
Proposed certification basis Proposition de base de certification					✓
Certification plan in accordance with CAR 521.155(d) Plan de certification selon RAC 521.155(d)					✓
Applicant's remarks / Remarques du demandeur Revision to FAA STC SR03317NY					
I hereby certify that the information contained herein is correct and complete. I agree to pay charges as prescribed in Part 1, Subpart 4 of the CARs (CAR 104-Charges). Je certifie que les renseignements figurant ci-dessus sont exacts et complets. Je m'engage à payer les redevances prescrites à la sous-partie 4 de la partie I du RAC (sous-partie 104 du RAC - Redevances).					
Name and Signature of Applicant / Nom et signature du demandeur <u>Jeff Clarke</u>		Title / Poste <u>VICE PRESIDENT</u>		Date (yyyy-mm-dd) / Date (aaaa-mm-jj) <u>2014-12-30</u>	

B429 Post S/N 81 Fittings

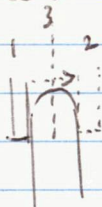
Setup Notes

Rotate Vise 6.4° CW = LH CCW = RH

Rotate head towards operator 6.35°

* ensure head is aligned to Y axis *

Set ϕ
X:



- 1 touch one side, set ϕ X
 - 2 touch other side (2.125 nom)
 - 3 Split reading from 2 (1.063 nom)
- Set ϕ X

Set ϕ Y



touch close side, set ϕ Y

Set ϕ Z



with cutter @ XO Y 1.063 touch top.

M.O / AFT FITTINGS \rightarrow hole on close side





U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

FORM APPROVED
OMB No. 2120-0018
EXP DATE: 4/30/2015

APPLICATION FOR TYPE CERTIFICATE, PRODUCTION CERTIFICATE, OR SUPPLEMENTAL TYPE
CERTIFICATE

1. Name Of Applicant Aero Design Ltd.	2. Application made for : <input type="checkbox"/> Type Certificate <input type="checkbox"/> Production Certificate <input type="checkbox"/> Supplemental Type Certificate <input type="checkbox"/> Amended Type Certificate <input checked="" type="checkbox"/> Amended Supplemental Type Certificate	3. Product Involved Aircraft <input checked="" type="checkbox"/> Engine <input type="checkbox"/> Propeller <input type="checkbox"/>
4. Address 9888A Malaspina Road	b. City Powell River State BC	c. Zip Code V8A 0G3 (Canada)

5. TYPE CERTIFICATE (Complete item 5a below)

a. Model designation(s) (All models listed are to be completely described in the required technical data, including drawings representing the design, material, specifications, construction, and performance of the aircraft, aircraft engine, propeller which is the subject of this application.)

6. PRODUCTION CERTIFICATE (Complete items 6a-c below. Submit with this form, in manual form, one copy of quality control data or changes thereto covering new products, as required by applicable FAR.)

a. Factory address (if different from above)	b. Application is for New production certificate <input type="checkbox"/> Additions to production Certificate (Give P.C. No.) <input type="checkbox"/>	P.C. No. T.C./S.T.C. No.
c. Applicant is holder of or a licensee under a Type Certificate or a Supplemental Type Certificate (Attach evidence of licensing agreement and give certificate number)		

7. SUPPLEMENTAL TYPE CERTIFICATE (Complete items 7a-d below)

a. Make and model designation of product to be modified Bell 429, amend STC SR03317NY	
b. Description of modification Installation of mounting provisions, quick release cargo basket, and cabin steps. The basket mounts to the fuselage using the existing hardpoints for the cabin step. The original step is removed and fittings are installed, with mounting beams attached to the new fittings. Revision is to add configuration compatible with aircraft S/N 57081 and sub.	
c. Will data be available for sale or release to other persons? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	d. Will parts be manufactured for sale? (Ref. FAR 21.303) Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

8. CERTIFICATION - I certify that the above statements are true.

Signature of certifying official 	Title Vice president	Date 30 December 2014
--------------------------------------	--------------------------------	---------------------------------



Application for Approval of Major Change / Major Repair Design

Data protection: Personal data included in this application is processed by EASA pursuant to Regulation (EC) No 45/2001 on the protection of individuals with regard to the processing of personal data by the Community institutions and bodies and on the free movement of such data. It will be processed solely for the purposes of the performance, management and follow-up of the Application by the Agency, without prejudice to possible transmission to internal audit services, to the Court of Auditors, to the European Anti-Fraud Office (OLAF) for the purposes of safeguarding the financial interests of the European Union. The Applicant shall have the right of access to his personal data and the right to rectify any such data that is inaccurate or incomplete. Should the Applicant have any queries concerning the processing of his personal data, he shall address them to the Agency at the following address: dpo [at] easa.europa.eu. The Applicant shall have right of recourse at any time to the European Data Protection Supervisor.

1. Applicant's Reference

1.1 Your Reference

959

2. Applicant Address and Contact Data

2.1 Applicant Data

2.1.1 Name and Address (registered (business) name and address/legal seat of the company)

Applicant Number	300116	(A)DOA Reference	if applicable
(Company) Name	Aero Design Ltd.		
Street / Nr	9888A Malaspina Road		
Post Code	V8A 0G3		
City	Powell River, BC		
Country	Canada		

2.1.2 Contact Person (responsible for this application)

Title	<input checked="" type="checkbox"/> Mr <input type="checkbox"/> Ms	
Name	Clarke	
First name	Jeff	
Job title	Engineering Technologist	
Phone/Fax	Phone: 604-483-2376 Fax: 604-483-2372	
Email	jeff@aerodesign.ca	

Important Note: First time applicants need to submit a copy of the company's **Business Registration** or similar legal document stating name and seat of the company together with the application. In case the applicant is not a company but a natural person, a copy of the person's **ID or passport** needs to be provided with the first application.

2.2 Billing Data (may be left blank, if same as 2.1 Applicant Data)

2.2.1 Billing Address (For the receipt of EASA Fees and Charges Invoices. EASA invoices are issued via post- mail to the address provided here.)

(Company) Name	Same as in section 2.1.1 (other name only in exceptional cases)
Street / Nr	
PO Box	
Post Code	
City	
Country	

2.2.2 Contact Person (Responsible for ensuring the EASA terms of payment are honoured. An electronic invoice copy will be issued to the email address indicated here.)

Title	<input type="checkbox"/> Mr <input checked="" type="checkbox"/> Ms	
Name	Rekve	
First name	Wanda	
Job title	Office Manager	
Phone/Fax	Phone: 604-483-2376 Fax: 604-483-2372	
Email	wanda@aerodesign.ca	

**Application for
Approval of Major Change / Major Repair Design****2.3 Shipping Data** (may be left blank, if same as 2.1 Applicant Data)

2.3.1 Certificate Delivery Address (for the shipping of original EASA documents)	(Company) Name	
	Street / Nr	
	PO Box	
	Post Code	
	City	
	Country	
2.3.2 Contact Person (Shipping)	Title	<input type="checkbox"/> Mr <input type="checkbox"/> Ms
	Name	
	First name	
	Job title	
	Phone/Fax	
	Email	

**Application for
Approval of Major Change / Major Repair Design****3. Identification of Activity****Major Change***

- ☐ Simple
☐ Standard
☐ Complex

Major Repair

- ☐ Simple
☐ Standard
☐ Complex

Major Change to STC

- ☒ Simple
☐ Standard
☐ Complex

☐ **Derivative**

Including change to approved parts of Flight Manual (FM)

- ☒ Yes
☐ No

*For changes involving **Substantial Change(s)** as defined in Subpart B of the Annex to Regulation (EU) No.748/2012 please complete and submit an **Application for Type Certificate/Restricted Type Certificate**.

4. Product Identification**4.1 Fees & Charges Information****Large Aeroplanes**

- ☐ > 150 000 kg
☐ > 50 000 kg ≤ 150 000 kg
☐ > 22 000 kg ≤ 50 000 kg
☐ > 5 700 kg ≤ 22 000 kg (excluding commuter)

General Aviation

- ☐ > 5 700 kg ≤ 22 000 kg (including commuter)
☐ > 2 000 kg ≤ 5 700 kg
☐ ≤ 2 000 kg
☐ High Performance Aircraft (≤ 5 700 kg)
☐ Very Light Aeroplane
☐ Powered Sailplane
☐ Sailplane
☐ Light Sport Aeroplane

Rotorcraft, Balloons & Airships

- ☒ Large Rotorcraft
☐ Medium Rotorcraft
☐ Small Rotorcraft
☐ Very Light Rotorcraft
☐ Balloon
☐ Large Airship
☐ Medium Airship
☐ Small Airship

Propulsion

- ☐ Turbine Engine > 25 kN take-off thrust
☐ Turbine Engine ≤ 25 kN take-off thrust
☐ Turbine Engine > 2000 kW take-off power
☐ Turbine Engine ≤ 2000 kW take-off power
☐ Non-Turbine Engine
☐ CS-22.H, CS VLR App. B Engine
☐ Propeller for use on aircraft > 5 700 kg MTOW
☐ Propeller for use on aircraft ≤ 5 700 kg MTOW
☐ CS-22J Class Propeller
☐ APU (Parts & Appliances)

4.2 Applicability

Type Certificate Number

IM.R.506 (Canadian Type Certificate H-107)

Type Certificate Holder

Bell Helicopter Textron Canada Ltd.

Type Name

Rotorcraft

Model(s)

429

**Application for
Approval of Major Change / Major Repair Design**

4.3 Airworthiness Code	CS-27 Cat. A		
4.4 European Light Aircraft	<input type="checkbox"/> Non-ELA	<input type="checkbox"/> ELA 1 <input type="checkbox"/> ELA 2	please consult the completion instructions for definitions of ELA 1 and ELA 2 aircraft

5. Original Approval(if applicable)

5.1 EASA Approval N° (or reference to grandfathered certificate/approval issued by a European NAA prior to 28 September 2003)	Approval Number	10043360, Rev. 1
	Issued by	EASA
	Issued on	25 January 2013
5.2 Third Country Approval N°	Approval Number	SH12-58, Issue 3
	Issued by	Transport Canada
	Issued on	03 December 2014

6. Description

6.1 Title	Installation of External Attachment Provisions, Cargo Basket, and Cabin Steps.
6.2 Description	Installation of attachment fittings on the existing hard points for the cabin step. Installation of mounting beams on the attachment fittings. Installation of cargo basket on mounting beams. Installation of cabin access steps on the mounting provisions.
6.3 Affected Areas (including manuals)	See certification plan CP959.10, revision 2; Flight Manual Supplements FMS959.90 and FMS969.90, Instructions for Continued Airworthiness ICA959.91 and ICA969.91
6.4 Re-Investigations	
6.5 Justification (non TC-holder repairs only)	

7. Part 21 demonstration of eligibility**I declare that this application is:**

<input type="checkbox"/> Within the current approved scope of work of the applicant's DOA/ADOA		
<input type="checkbox"/> Undertaken by another person than the applicant for, or holder of, a certificate (Part 21.A.2)	Name	(Company) Name
	DOA/ADOA N°	DOA/ADOA N°
<input type="checkbox"/> Following an application for Design Organisation Approval (FO.DOA.00080) or Alternative Procedures to Design Organisation Approval (FO.DOA.00081).	Application Date	
	Project N°	if known
<input type="checkbox"/> Following an application for a change to the scope of work via	Application Date	



European Aviation Safety Agency

Form

**Application for
Approval of Major Change / Major Repair Design**

EASA Form FO.DOA.00081 or FO.DOA.00082.

Project N°

if known

**Application for
Approval of Major Change / Major Repair Design**☒ Without DOA/ADOA☐ Use of Article 8.2 of Regulation (EU) No. 748/2012☐ Covered by a Certification Programme in accordance with 21.A.20(c) for ELA 1 aircraft or engine/propeller installed on an ELA 1 aircraft.☒ Bilateral Agreement/Working Arrangement is in force**8. Applicant's declaration and acceptance of the General Conditions and Terms of Payment**

I declare that I have the legal capacity to submit this application to EASA and that all information provided in this application form is correct and complete.

I have understood that I am submitting an application for which fees or charges will be levied by EASA in accordance with Commission Regulation (EU) on the fees and charges levied by the European Aviation Safety Agency, as last amended and available from [http://easa.europa.eu/>Regulations> Fees and Charges](http://easa.europa.eu/>Regulations>Fees and Charges).

I acknowledge that I have read and understood the Agency's Terms of Payment (see [http://easa.europa.eu/> the Agency>FAQs > Fees & Charges >Terms of Payment](http://easa.europa.eu/>the Agency>FAQs > Fees & Charges >Terms of Payment)) and agree to abide by them. I declare to be aware that fees or charges, as well as all relevant travel costs must be paid whether or not the application is successful and that they might not be refundable. Moreover, I declare that I am aware of the consequences of non-payment.

POWELL RIVER, BC, CANADA

03 DEC 2014

Date/Location

JEFF CLARKE

Name

Signature

Important Note: EASA cannot accept applications without signature. Please make sure that you sign the application.

This Application should be sent by fax, e-mail or regular mail to:

European Aviation Safety Agency
Certification and Approval Support Department
Postfach 10 12 53
D-50452 Köln
Germany

Fax: +49 (0)221 89990 ext. 4458

E-mail: MajorChange-MajorRepair@easa.europa.eu**Completion Instructions**

Completion
Instructions

Please double-click on the icon to
access the completion instructions



Completion Instructions for the Application for Approval of Major Change / Major Repair Design

This Application Completion Instruction Sheet will provide you with any additional instructions and requirements necessary to complete the Application for Approval of Major Change / Major Repair Design. It is strongly recommended to use the English language in completing the form. Please complete the form in a **clearly legible** way.

# - Field Name	Completion Instructions																
1.1 Your Reference	Please provide a unique internal reference to this application. This reference will be used as an identifier of your application in all communication, e.g. invoice/s, acceptance letter, by EASA.																
2.1.1 Name and Address	<p>Applicant Number: If known, please enter your EASA Applicant Number. This number follows the pattern 3XXXXX and can be found on any application acceptance letter received for previous applications. It is called either "Customer Number " or "Applicant Number" on the application acceptance letter.</p> <p>Please enter the full name of the company as it appears on the Business Registration or similar legal document stating name and seat of the company. If applicable also enter the Trade Name, Doing-business-as and the Company registration number. Please enter the address of the registered office as it appears on the Business Registration or similar legal document. First time applicants need to submit a copy of the company's Business Registration or similar legal document stating name and seat of the company together with the application. If applicable, an additional translation of this document (done by an authorised translator, signed and stamped) should be submitted.</p> <p>In case the applicant is not a company but a natural person, please enter the full name as it appears in the ID Card/Passport and enter the address of registry. A copy of the person's ID or passport needs to be provided with the first application.</p>																
2.1.2 Contact Person	The name and contact details specified in this section are those of the person responsible for the application.																
2.2.1 Billing Address	The (company) name and address specified in this section will be printed on the invoice/s EASA will issue. A (company) name deviating from the one entered in section 2.1.1 can only be accepted by EASA upon justified request. A written statement, signed and stamped, from the legal entity which is taking responsibility to pay the EASA F&C invoice(s) is to be submitted together with the application.																
2.2.2 Contact Person	The name and contact details specified in this section are those of the person that will be contacted for all issue connected with the EASA invoice/s. (e.g. accounts payable clerk). Responsible for ensuring the EASA terms of payment are honoured. An electronic invoice copy will be issued to the email address indicated here.																
2.3.1 Shipping Address	The (company) name and address specified in this section is where EASA will send the original certificate/approval.																
2.3.2 Contact Person	The contact person of this section is the person the original certificate/approval will be sent to.																
3. Identification of Activity	<p>Please indicate the nature of your application, Major Change, Major Repair, Major Change to Supplemental Type Certificate or Derivate, by ticking the applicable box. Only one activity may be chosen per application.</p> <p>F&C Regulation - Part V - Explanatory Note (7)</p> <table><thead><tr><th></th><th>Simple</th><th>Standard</th><th>Complex</th></tr></thead><tbody><tr><td>EASA Supplemental Type Certificate (STC) EASA major design changes EASA major repairs</td><td>STC, major design change, or repair, only involving current and well-proven justification methods, for which a complete set of data (description, compliance check-list and compliance documents) can be communicated at time of application, and for which the applicant has demonstrated experience, and which can be assessed by the project certification manager alone, or with a limited involvement of a single discipline specialist.</td><td>All other STC, major design changes or repairs.</td><td>Significant (*) STC or major design change.</td></tr><tr><td>Validated US Federal Aviation Administration (FAA) STC</td><td>Basic (**)</td><td>Non-basic</td><td>Significant non-basic</td></tr><tr><td>Validated FAA major design change</td><td>Level 2 (**) major design changes when not automatically accepted. (***)</td><td>Level 1 (**)</td><td>Significant level 1</td></tr></tbody></table>		Simple	Standard	Complex	EASA Supplemental Type Certificate (STC) EASA major design changes EASA major repairs	STC, major design change, or repair, only involving current and well-proven justification methods, for which a complete set of data (description, compliance check-list and compliance documents) can be communicated at time of application, and for which the applicant has demonstrated experience, and which can be assessed by the project certification manager alone, or with a limited involvement of a single discipline specialist.	All other STC, major design changes or repairs.	Significant (*) STC or major design change.	Validated US Federal Aviation Administration (FAA) STC	Basic (**)	Non-basic	Significant non-basic	Validated FAA major design change	Level 2 (**) major design changes when not automatically accepted. (***)	Level 1 (**)	Significant level 1
	Simple	Standard	Complex														
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Validated US Federal Aviation Administration (FAA) STC	Basic (**)	Non-basic	Significant non-basic														
Validated FAA major design change	Level 2 (**) major design changes when not automatically accepted. (***)	Level 1 (**)	Significant level 1														



Completion Instructions for the Application for Approval of Major Change / Major Repair Design

	Validated FAA major repair	N/A (automatic acceptance)	Repairs on critical component (**)	N/A
	<p>(*) "Significant" is defined in paragraph 21.A.101 (b) of the Annex to Regulation (EU) No 748/2012 (and similarly in FAA 14CFR 21.101 (b)).</p> <p>(**) For the definitions of "basic", "non-basic", "level 1", "level 2", "critical component" and "Certifying Authority", see the applicable bilateral agreement under which the validation takes place.</p> <p>(***) Automatic acceptance criteria by EASA for level 2 major changes are defined in the applicable bilateral agreement under which the validation takes place.</p>			
4.1 Fees and Charges Information	<p>The weight category shall refer to the maximum take-off weight (MTOW) of the aircraft type/model as specified in the type certificate data sheet.</p> <p>The MTOW of the initial Type Certificates and subsequently of the majority (more than 50%) of the related models covered by this Type Certificate determines the applicable MTOW category.</p> <p>High Performance Aircraft in the weight category up to 5 700 kg [12 500 lbs] are those aeroplanes having a Mmo greater than 0.6 and/ or a maximum operating altitude above 25 000 ft. They shall be charged as defined in the categories 'over 5 700 kg[12 500 lbs] up to 22 000 kg'.</p> <p>Large Rotorcraft refers to CS-29 and CS-27 cat A;</p> <p>Small Rotorcraft refers to CS-27 with Maximum Take Off Weight (MTOW) below 3 175 Kg and limited to 4 seats, including pilot;</p> <p>Medium Rotorcraft refers to other CS-27.</p> <p>Small Airships refer to</p> <ul style="list-style-type: none"> all Hot Air Airships independent of their size, Gas Airships up to a volume 2 000 m³; <p>Medium Airships refer to Gas Airships with a volume of</p> <ul style="list-style-type: none"> more than 2 000 m³ up to 15 000 m³; <p>Large Airships refer to Gas Airships with a volume of</p> <ul style="list-style-type: none"> more than 15 000 m³. <p>Changes/repairs on APU shall be regarded as changes/repairs to engines of the same power rating.</p>			
4.2 Applicability	Identify the Type Certificate Number, the Type Certificate Holder, the Type and Model(s) to which this application is applicable. If applicable, please also identify variant(s).			
4.3 Airworthiness Code	Identify the applicable airworthiness code proposed to be used for EASA certification.			
4.4 European Light Aircraft	ELA1 ELA1 aircraft means the following manned European Light Aircraft:	ELA2 ELA2 aircraft means the following manned European Light Aircraft:		
	an airplane with a Maximum Take-off Mass (MTOM) of 1 200 kg or less that is not classified as complex motor-powered aircraft	an airplane with a Maximum Take-off Mass (MTOM) of 2 000 kg or less that is not classified as complex motor-powered aircraft		
	a sailplane or powered sailplane of 1 200 kg MTOM or less	a sailplane or powered sailplane of 2 000 kg MTOM or less		
	a balloon with a maximum design lifting gas or hot air volume of <ul style="list-style-type: none"> not more than 3 400 m³ for hot air balloons 1 050 m³ for gas balloons 300 m³ for tethered gas balloons 	a balloon		
	an airship designed for not more than <ul style="list-style-type: none"> 4 occupants and <ul style="list-style-type: none"> a maximum design lifting gas or hot air volume of not more than 3 400 m³ for hot air airships and <ul style="list-style-type: none"> 1 000 m³ for gas airships 	a hot air airship a gas airship complying with all of the following characteristics: <ul style="list-style-type: none"> 3% maximum static heaviness Non-vector thrust (except reverse thrust) Conventional and simple design of: structure, control system and ballonet system Non-power assisted controls 		
		a Very Light Rotorcraft		



**Completion Instructions for the Application for Approval of
Major Change / Major Repair Design**

Please take note of Art. 21.A.101 (e) of Commission Regulation (EU) No 748/2012 with regard to the expiry of your application.

5.1 EASA Approval N°	Identify the original EASA or grandfathered NAA approval number in case of a revision to an existing approval.											
5.2 Third Country Approval N°	Identify the original 3rd country approval number in case of a revision or validation of an existing approval.											
6.1 Title	Give a short title not exceeding 40 characters.											
6.2 Description	Give a brief description of the design change / damage and repair design.											
6.3 Affected Areas	Identify all parts of the type design and the approved manuals affected by the change / repair, and the certification specifications and environmental protection requirements with which the change / repair has been designed.											
6.4 Re-Investigations	If necessary, make reference to further attached documents, e.g. relating to Part 21, § 21.A.101 compliance.											
6.5 Justification	Identify any re-investigations necessary to show compliance of the changed / repaired product / equipment with the applicable certification specification and environmental requirements; if necessary make reference to further attached documents.											
7. Part 21 demonstration of eligibility	Please choose the applicable way of demonstrating eligibility in accordance with Part 21 by ticking the relevant box. Reference can be made to ongoing projects for new (A)DOA or extending the scope of the (A)DOA. Applicants from countries not located in an EASA member state do not need to demonstrate eligibility via an (A)DOA or certification programme.											
	<table border="1"><thead><tr><th>Certification Programme</th><th>AP DOA</th></tr></thead><tbody><tr><td>Demonstration of capability via a certification programme for:</td><td>Demonstration of capability via AP DOA for:</td></tr><tr><td>ELA1 aircraft</td><td>ELA2 aircraft</td></tr><tr><td>Engine [to be] installed on ELA1 aircraft</td><td>Engine [to be] installed on ELA2 aircraft</td></tr><tr><td rowspan="7">Propeller [to be] installed on ELA1 aircraft</td><td>Propeller [to be] installed on ELA2 aircraft</td></tr><tr><td>Piston Engine</td></tr><tr><td>Fixed or adjustable pitch propeller</td></tr></tbody></table>	Certification Programme	AP DOA	Demonstration of capability via a certification programme for:	Demonstration of capability via AP DOA for:	ELA1 aircraft	ELA2 aircraft	Engine [to be] installed on ELA1 aircraft	Engine [to be] installed on ELA2 aircraft	Propeller [to be] installed on ELA1 aircraft	Propeller [to be] installed on ELA2 aircraft	Piston Engine
Certification Programme	AP DOA											
Demonstration of capability via a certification programme for:	Demonstration of capability via AP DOA for:											
ELA1 aircraft	ELA2 aircraft											
Engine [to be] installed on ELA1 aircraft	Engine [to be] installed on ELA2 aircraft											
Propeller [to be] installed on ELA1 aircraft	Propeller [to be] installed on ELA2 aircraft											
	Piston Engine											
	Fixed or adjustable pitch propeller											



EASA
European Aviation Safety Agency
Postfach 10 12 53
D 50452 Köln



Deutsche Post 
FRANKIT 0,50 EUR
26.05.15 3D02000494
Brief Kilotarif
PP - PRIORITY



SUPPLEMENTAL TYPE CERTIFICATE

10043360, REV. 2

This Supplemental Type Certificate is issued by EASA, acting in accordance with Regulation (EC) No. 216/2008 on behalf of the European Community, its Member States and of the European third countries that participate in the activities of EASA under Article 66 of that Regulation and in accordance with Commission Regulation (EU) No. 748/2012 to

AERO DESIGN LTD.

**9888A MALASPINA ROAD
POWELL RIVER BC V8A 0G3
CANADA**

and certifies that the change in the type design for the product listed below with the limitations and conditions specified meets the applicable Type Certification Basis and environmental protection requirements when operated within the conditions and limitations specified below:

Original Type Certificate Number : EASA.IM.R.506

Type Certificate Holder : BELL HELICOPTER TEXTRON CANADA

Type Design - Model : 429

Original STC Number : TCCA SH12-58 ISSUE 3

Description of Design Change:

INSTALLATION OF EXTERNAL ATTACHMENT PROVISIONS, CARGO BASKET AND CABIN STEPS

CONFIGURATION A - External Attachment Provisions Only: Installation as defined in DCL959-2.

CONFIGURATION B - External Cargo Basket: Installation as defined in DCL959-1 and modifications eligible in accordance with DCL704-429.

CONFIGURATION C - Cabin Steps: Installation as defined in DCL969-1.

Revision 2 of this STC, following TCCA STC No. SH12-58 Issue 3, includes adaptations to the changed fuselage design in rotorcraft S/N 57081 and subsequent, introduction of limitations/conditions for the installation of cabin steps and modifications to the cargo basket design.

See Continuation Sheet(s)

For the European Aviation Safety Agency,

Date of issue: 13 May 2015


Massimo MAZZOLETTI
Head of Rotorcraft Department

Note:

The following numbers are listed on the certificate:
EASA current Project Number: 0010020992-001

EASA Certification Basis:

The Certification Basis for the original product remains applicable to this certificate/ approval.
The requirements for environmental protection and the associated certified noise and/ or emissions levels of the original product are unchanged and remain applicable to this certificate/ approval.

Associated Technical Documentation:**CONFIGURATION A:**

- Aero Design Ltd. Document Control List, DCL959-2, Rev. 2, dated 12 September 2014

CONFIGURATION B:

- Aero Design Ltd. Document Control List, DCL959-1, Rev. 2, dated 12 September 2014,
- Aero Design Ltd. Document Control List, DCL704-429, Rev. 1, dated 12 September 2014

CONFIGURATIONS A AND B:

- Aero Design Ltd. Flight Manual Supplement FMS959.90, Rev. 2, dated 15 September 2014
- Aero Design Ltd. Instructions for Continued Airworthiness ICA959.91, Rev. 1, dated 4 September 2014

CONFIGURATION C:

- Aero Design Ltd. Document Control List, DCL969-1, Rev. 2, dated 12 September 2014
- Aero Design Ltd. Flight Manual Supplement FMS969.90, Rev. 2, dated 15 September 2014.
- Aero Design Ltd. Instructions for Continued Airworthiness ICA969.91, Rev. 1, dated 8 May 2014

or later revisions of the above listed documents approved by EASA in accordance with the Technical Implementation Procedures of EU/ Canada Bilateral Agreement.

Limitations/Conditions:

1. Installation of Configuration A, external attachment provisions, is a pre-requisite for installation of Configuration B, external cargo basket.
2. Installation of Configuration A, external attachment provisions, is a pre-requisite for installation of Configuration C, cabin steps.
3. Installation of the Fixed Cabin Step in accordance with DCL969-1 is mandatory.
4. Installation of the Quick Release Cabin Step in accordance with DCL969-1 is mandatory when the External Cargo Basket (Configuration B) is removed from the external attachment provisions (Configuration A).
5. This design change is not compatible with the installation of floats.
6. Prior to installation of this design change it must be determined that the interrelationship between this design change and any other previously installed design change and/ or repair will introduce no adverse effect upon the airworthiness of the product.

- end -

Note:

The following numbers are listed on the certificate:
EASA current Project Number: 0010020992-001

PLEASE USE ROUTING SYMBOL ON ALL CORRESPONDENCE

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**EDMONTON OPERATIONS DIVISION
ENGINEERING
1100, 9700 JASPER AVENUE, NW
EDMONTON AB T5J 4E6 #31**

**Attn.: Mr. Jeff Clarke
Aero Design Ltd.
9888A Malaspina Road
POWELL RIVER BC CANADA V8Z 0G3**

**Transport Canada
1100 - 9700 Jasper Avenue
Canada Place
Edmonton AB T5J 4E6**



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1211 151100



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Edmonton, Alberta, T5J 4E6
Canada

Your file Votre référence
959, 969

Our file Notre référence
C-14-0212
SH12-58 Iss. 3

3 December 2014

Aero Design Ltd.
9888A Malaspina Road
Powell River, British Columbia
Canada V8A 0G3

Subject: STC SH12-58 Issue 3, Bell 429, Installation of External Attachment Provisions, Cabin Steps, and Cargo Basket

This Supplemental Type Certificate, SH12-58 Issue 3, is issued in response to your application. Included with the STC SH12-58 Issue 3 are the documents bearing original Transport Canada signatures.

The transfer of this STC SH12-58 Issue 3 in the name of another person requires the prior approval from the Minister in accordance with Section 521.357 of the Canadian Aviation Regulations (CAR).

Embodiment of modifications requiring certification of detail part fabrication and installation, in accordance with approved data identified on the certificate, is considered to be a maintenance activity and the requirements of subsection 571.06(4) of the CARs will apply.

A Canadian Holder is required to fulfill the responsibilities of a Design Approval Document Holder in accordance with Division VIII of Subpart 521 of the CAR, including the reporting of any service difficulties experienced with their product. Therefore, should you become aware of any defect, malfunction or failure resulting from the design change, it is your responsibility to submit a Service Difficulty Report to Transport Canada.

Yours truly,

J. Staal
Certification Technologist
Engineering, Edmonton
Prairie and Northern Region
780-495-5227
jack.staal@tc.gc.ca

Enclosure(s)

Canada

Enclosure List

Supplemental Type Certificate SH12-58 Issue 3 ✓
Rotorcraft Flight Manual Supplement FMS959.90 Rev 2 dated 15 September 2014 ✓
Rotorcraft Flight Manual Supplement FMS969.90 Rev 2 dated 15 September 2014 ✓
Document Control List DCL959-2 Rev 2 dated 12 September 2014 ✓
Document Control List DCL959-12 Rev 1 dated 12 September 2014 ✓
Document Control List DCL959-16 Rev 0 dated 12 September 2014 ✓
Document Control List DCL959-1 Rev 2 dated 12 September 2014 ✓
Document Control List DCL959-11 Rev 1 dated 12 September 2014 ✓
Document Control List DCL959-15 Rev 0 dated 12 September 2014 ✓
Document Control List DCL969-1 Rev 2 dated 12 September 2014 ✓
Document Control List DCL969-11 Rev 1 dated 12 September 2014 ✓
Document Control List DCL704-429 Rev 1 dated 12 September 2014 ✓
MSI53 for ICA959.91 ✓
ICA 959.91 Rev 1 dated 4 September 2014 ✓
MSI53 for ICA969.91 ✓
ICA 969.91 Rev 1 dated 8 May 2014 ✓
Certification Plan CP959.10 Rev 2 dated 27 August 2014 ✓

J.Staal

3 December 2014



Department of Transport

Supplemental Type Certificate

This approval is issued to:

Aero Design Ltd.
9888A Malaspina Road
Powell River, British Columbia
Canada V8A 0G3

Number: SH12-58

Issue No.: 3

Approval Date: November 16, 2012

Issue Date: December 03, 2014

Responsible Office: Prairie and Northern
Aircraft/Engine Type or Model: Bell 429
Canadian Type Certificate or Equivalent: H-107 (Bell 429)

Description of Type Design Change: Installation of External Attachment Provisions, Cargo Basket, and Cabin Steps

**Installation/Operating Data,
Required Equipment and Limitations:**

Configuration A – External Attachment Provisions Only:

Installation of the External Attachment Provisions to be completed in accordance with Transport Canada approved, Aero Design Ltd. Document Control List, DCL959-2, Revision 2, dated 12 September 2014, or later approved revision.

Configuration B – External Cargo Basket:

Installation of Configuration A, External Attachment Provisions, is a prerequisite for installation of Configuration B, External Cargo Basket Installation. Installation of Quick Release Cargo Basket to be completed in accordance with Transport Canada approved, Aero Design Ltd. Document Control List, DCL 959-1, Revision 2, dated 12 September 2014, or later approved revision.

(continued)

Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated **will not** adversely affect the airworthiness of the modified product.



F.J.B. Wright
For Minister of Transport



NOTE: THIS ADDENDUM SHALL REMAIN PART OF THE CERTIFICATE REFERRED TO THEREIN.

Configuration C - Cabin Steps

Installation of Configuration A, External Attachment Provisions, is a prerequisite for installation of Configuration C, Cabin Steps Installation. Installation of Cabin Steps to be completed in accordance with Transport Canada approved, Aero Design Ltd. Document Control List, DCL969-1, Revision 2, dated 12 September 2014, or later approved revision.

Transport Canada approved, Aero Design Ltd. Flight Manual Supplement FMS969.90, Revision 2, dated 15 September 2014, or later approved revision is required with this installation.

Transport Canada accepted, Aero Design Ltd. Instructions for Continued Airworthiness ICA969.91, Revision 1, dated 8 May 2014, or later accepted revision is required with this installation.

Installation of the Fixed Cabin Step in accordance with DCL969-1 is mandatory. Installation of the Quick Release Cabin Step in accordance with DCL969-1 is mandatory when the External Cargo Basket (Configuration B) is removed for the External Attachment Provisions (Configuration A).

Cargo Basket Modifications:

Modifications to the Cargo Basket configurations are eligible in accordance with Transport Canada approved, Aero Design Ltd., Document Control List DCL704-429, Revision 1, dated 2 September 2014, or later approved revision.

Data Pertinent to Configurations A and B:

Transport Canada approved, Aero Design Ltd. Flight Manual Supplement FMS959.90, Revision 2, dated 15 September 2014, or later approved revision is required with this installation.

Transport Canada accepted, Aero Design Ltd. Instructions for Continued Airworthiness ICA959.91, Revision 1, dated 4 September 2014, or later accepted revision is required with this installation.

Basis of Certification:

Basis of certification remains as defined in the applicable Type Certificate Data Sheets.

— End —

Aero Design Ltd.



9888A Malaspina Road
Powell River, BC, V8A 0G3
Phone: 604-483-2376
Fax: 604-483-2372
www.aerodesign.ca

FMS959.90

BELL 429

ROTORCRAFT FLIGHT MANUAL SUPPLEMENT for the INSTALLATION of the AERO DESIGN QUICK RELEASE CARGO BASKET

Canadian Supplemental Type Certificate No. SH12-58
FAA Supplemental Type Certificate No. SR03317NY
EASA Supplemental Type Certificate No. 10043360

Sections I, II, III and IV of this document comprise the Transport Canada Approved sections of this Flight Manual Supplement. Compliance with Section I, Limitations, is mandatory.

Section V and any subsequent sections if present are Unapproved and are provided for information only.

The information and data contained in this Flight Manual Supplement supersede or supplement that contained in the basic Approved Flight Manual for the Bell 429 when fitted with the Quick Release Cargo Basket Installation. For limitations, procedures and performance not listed in this Flight Manual Supplement, refer to the Approved Flight Manual and other approved Flight Manual Supplements.



Revision 2
15 September 2014

Page 1
TRANSPORT CANADA APPROVED

Record of Revisions

Revision	Issue Date	Pages Revised	Date Inserted	By
0	8 Nov 2012	None		
1	31 July 2013	1-8		
2	15 Sept 2014	all		

List of Effective Pages

Page	Revision No.
1	2
2	2
3	2
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5	2
6	2
7	2
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9	2
10.....	2

NOTE

Revised text is indicated by a black vertical line. A revised page with only a vertical line next to the page number indicates that text has shifted or that non-technical correction(s) were made on that page. Insert latest revision pages; dispose of superseded pages.

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I LIMITATIONS

1. The maximum load in the Aero Design Ltd. Quick Release Cargo Basket is 300 lb. (136 kg).
2. V_{NE} is 130 KIAS except when the V_{NE} of the basic rotorcraft is more restrictive, in which case the lower V_{NE} applies.
3. For Category A operations with the Cargo Basket installed, a weight penalty of 400 lbs must be added to the Gross Weight of the helicopter, in addition to the weight of the basket and the load it contains, when using the Category A WAT chart, and the Category A performance charts.
4. Configuration: The helicopter must be fitted with either the Quick Release Cargo Basket or Quick Release Step (see FMS969.90, Revision 2 or later approved revision) on the quick release mounting provisions.

Note: Fixed Cabin Step installed opposite to quick release mounting provisions must remain installed.

II NORMAL PROCEDURES

1. Pre-flight inspections:
 - a) Ensure that all cargo stored in the cargo basket is properly tied down and secured for flight.
 - b) Ensure that the lid of cargo basket is closed and secured.
 - c) Ensure the basket is locked in position on the beams. Pull up on the aft end of the basket to check.

CAUTION

It is possible to exceed the lateral centre of gravity limits of the rotorcraft under some loading conditions. Pilots must ensure that lateral C of G is within limits when loading the basket.

III EMERGENCY PROCEDURES

No change from basic Approved Flight Manual.

CAUTION:

The rotorcraft glide angle is steeper than that of the basic helicopter when the Aero Design Ltd. Cargo Basket is installed.

IV PERFORMANCE

With the cargo basket installed:

1. AEO and OEI Climb performance is reduced by up to 100 fpm.
2. Cruise performance and range are reduced by approximately 12 percent.
3. Category A Performance – A weight penalty of 400 lbs must be added to the Gross Weight of the helicopter, in addition to the weight of the basket and the load it contains, when using the Category A WAT chart, and the Category A performance charts.

V WEIGHT AND BALANCE

1. *Helicopter S/N 57001 – 57080.* The following weight and balance is for the quick release cargo basket configuration, installed in accordance with drawing 95901.

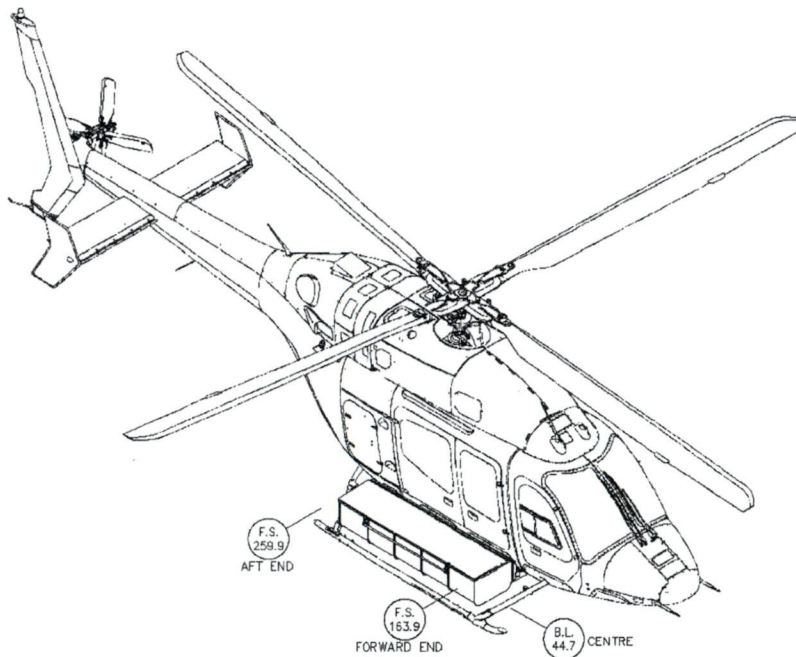


Figure V.1 – Quick Release Cargo Basket (95901 Configuration)

95901-01-XX Quick Release Cargo Basket Configuration

Item	Weight	Longitudinal		Lateral	
		Arm	Moment	Arm	Moment
Basket Only ¹	71.2 lb	211.9 in	15 084.4 in*lb	+/-44.7 in	+/-3182.6 in*lb
	32.3 kg	5381 mm	173 792 mm*kg	+/-1135 mm	+/-36 668 mm*kg
Cargo ² (MAX)	300 lb	211.9 in	63 558.0 in*lb	+/-44.7 in	+/-13410.0 in*lb
	136 kg	5381 mm	732 268 mm*kg	+/-1135 mm	+/-154 500 mm*kg

2. *Helicopter S/N 57081 & sub.* The following weight and balance is for the quick release cargo basket configuration, installed in accordance with drawing 95905.

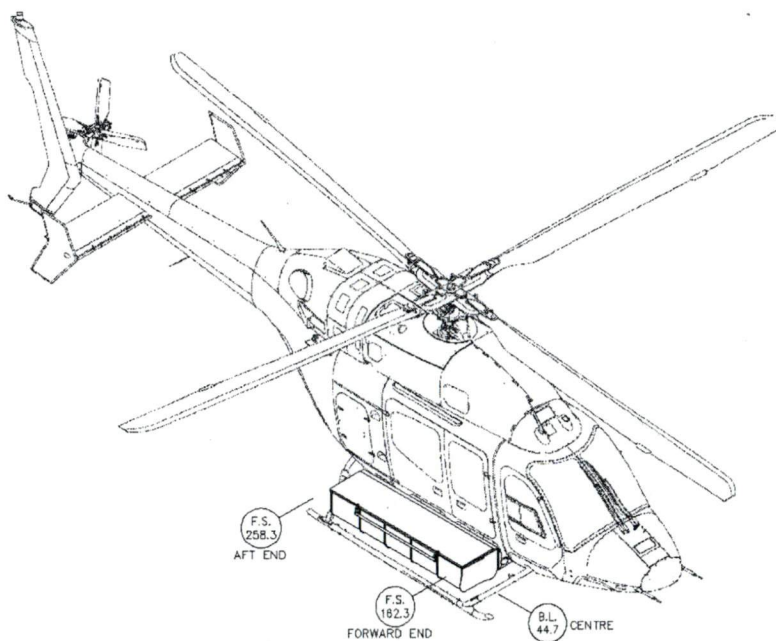


Figure V.1 – Quick Release Cargo Basket (95905 Configuration)

95905-01-XX Quick Release Cargo Basket Configuration

Item	Weight	Longitudinal		Lateral	
		Arm	Moment	Arm	Moment
Basket Only ¹	79.6 lb	210.4 in	16 743.1 in*lb	+/-44.7 in	+/-3558.1 in*lb
	36.1 kg	5343 mm	192 901 mm*kg	+/-1135 mm	+/-40 994 mm*kg
Cargo ² (MAX)	300 lb	210.3 in	63 102.0 in*lb	+/-44.7 in	+/-13410.0 in*lb
	136 kg	5343 mm	727 015 mm*kg	+/-1135 mm	+/-154 500 mm*kg

¹ Weight and balance is for Cargo Basket only. Mounting beams and attachment provisions are not included since they are included in the basic rotorcraft weight and balance at time of initial installation.

² Longitudinal and Lateral moment arms are given only for the center of the Cargo Basket. Due to the length of the basket, some loading arrangements may require that actual moment arms be measured, to determine the correct moments about the center of gravity.

CAUTION:

It is possible to exceed lateral CG limits in some configurations.

VI INSTALLATION / REMOVAL INSTRUCTIONS

The Quick Release Mounting Provisions are installed in accordance with drawing 95902, or 95906 and 59507. The Quick Release Basket is installed in accordance with drawing 95901 or 95905. If the Quick Release Cargo Basket is removed, the Quick Release Cabin Step must be installed, refer to FMS969.90. Logbook entry indicating installation or removal of basket and which weight and balance amendment is in effect is required.

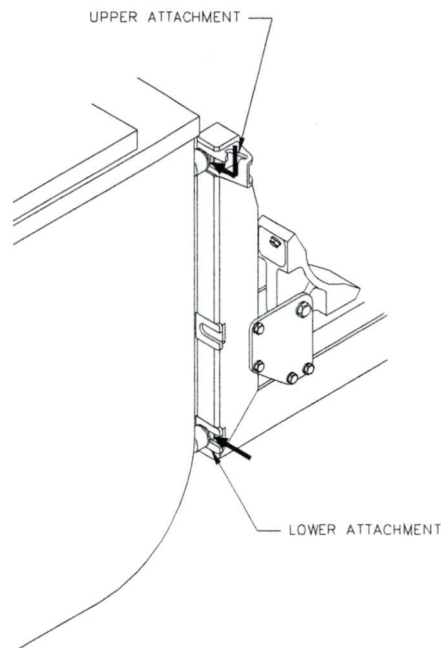


Figure VI.1 – Forward Basket Attachment

1. Basket Installation - Refer to Figure VI.1 and VI.2.
 1. Hook upper forward attachment on basket into upper keyway in forward mounting beam.
 2. Lift basket from aft end, slide lower forward attachment on basket into lower keyway on forward beam, and pull basket aft while rotating basket towards helicopter to seat attachments in forward beam.
 3. Lift basket to aft mounting beam, and engage aft attachments into keyways in aft beam.

4. Push basket down to lock basket into aft beam. Pin will spring into place with a snap.
5. Check that basket is locked in place by attempting to lift aft end of basket.

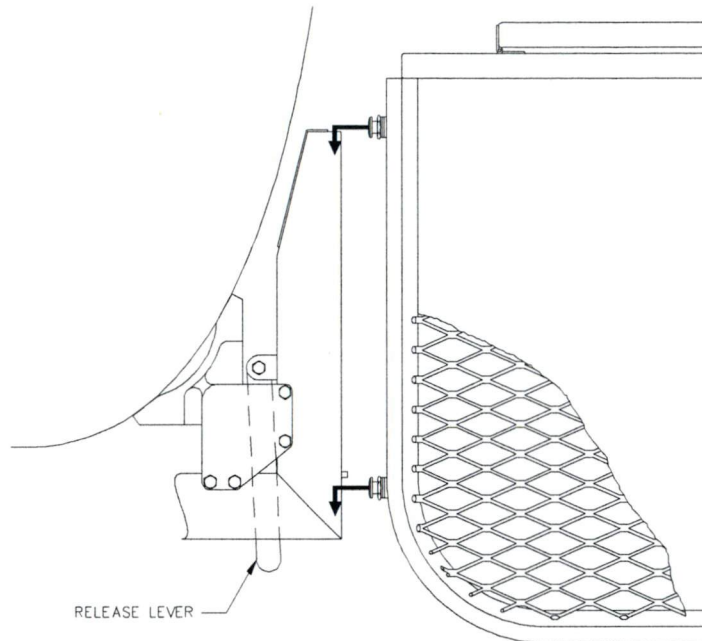


Figure VI.2 – Aft Basket Attachment

2. Basket Removal - Refer to Figure VI.1 and VI.2.
 1. Pull lever at bottom end of aft beam inboard and lift basket until lower attachment fitting is free of keyway. Keep upper basket attachment in slot in beam.
 2. Lift basket until upper attachment is out of keyway on aft beam.
 3. Slide basket forward and rotate aft end outboard until lower forward attachment on basket is free from keyway in forward beam.
 4. Lower aft end of basket to the ground.
 5. At forward end of basket, raise basket until upper attachment is free of keyway. Remove basket from helicopter.

Aero Design Ltd.



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FMS969.90

BELL 429

ROTORCRAFT FLIGHT MANUAL SUPPLEMENT for the INSTALLATION of the AERO DESIGN QUICK RELEASE CABIN STEP

Canadian Supplemental Type Certificate No. SH12-58
FAA Supplemental Type Certificate No. SR03317NY
EASA Supplemental Type Certificate No. 10043360

Sections I, II, III and IV of this document comprise the Transport Canada Approved sections of this Flight Manual Supplement. Compliance with Section I, Limitations, is mandatory.

Section V and any subsequent sections if present are Unapproved and are provided for information only.

The information and data contained in this Flight Manual Supplement supersede or supplement that contained in the basic Approved Flight Manual for the Bell 429 when fitted with the Quick Release Cabin Step Installation. For limitations, procedures and performance not listed in this Flight Manual Supplement, refer to the Approved Flight Manual and other approved Flight Manual Supplements.



Revision 2
15 September 2014

Page 1
TRANSPORT CANADA APPROVED

Record of Revisions

Revision	Issue Date	Pages Revised	Date Inserted	By
0	03 Dec 2012	None		
1	31 July 2013	1-3,5,6		
2	15 Sept 2014	all		

List of Effective Pages

Page	Revision No.
1	2
2	2
3	2
4	2
5	2
6	2
7	2

NOTE

Revised text is indicated by a black vertical line. A revised page with only a vertical line next to the page number indicates that text has shifted or that non-technical correction(s) were made on that page. Insert latest revision pages; dispose of superseded pages.

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II	Normal Procedures	4
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IV	Performance	4
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VI	Installation / removal instructions	6

I LIMITATIONS

1. Configuration: The helicopter must be fitted with either the Quick Release Step or Quick Release Cargo Basket (see FMS959.90, Revision 2 or later approved revision) on the mounting provisions. |

Note: Fixed Cabin Step installed opposite to quick release mounting provisions must remain installed.

II NORMAL PROCEDURES

1. Pre-flight inspections:
 - a) Ensure the step is locked in position on the beams. Pull up on the aft end of the step to check.

III EMERGENCY PROCEDURES

No change from basic Approved Flight Manual.

IV PERFORMANCE

No change from basic Approved Flight Manual.

V WEIGHT AND BALANCE

- The following weight and balance is for the quick release cabin step configuration, installed in accordance with drawing 96902 or 96906.

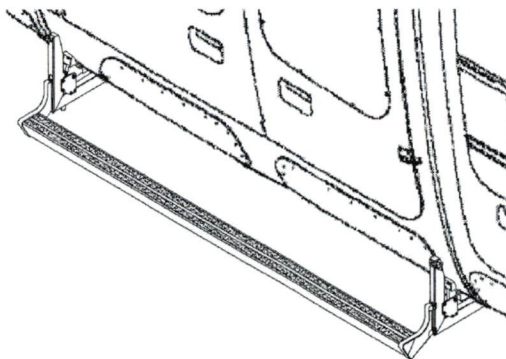


Figure V.1 – Quick Release Cabin Step (95902-01 Configuration)

96902-01-XX Quick Release Cabin Step Configuration
(S/N 57001 – 57080)

Item	Weight	Longitudinal		Lateral	
		Arm	Moment	Arm	Moment
Step Only ¹	6.0 lb	201.25 in	1207.50 in*lb	+/-35.76 in	+/-214.56 in*lb
	2.7 kg	5112 mm	13912 mm*kg	+/-908 mm	+/-2472 mm*kg

96906-01-XX Quick Release Cabin Step Configuration
(S/N 57081 & sub.)

Item	Weight	Longitudinal		Lateral	
		Arm	Moment	Arm	Moment
Step Only ¹	6.0 lb	199.75 in	1198.50 in*lb	+/-35.76 in	+/-214.56 in*lb
	2.7 kg	5074 mm	13808 mm*kg	+/-908 mm	+/-2472 mm*kg

¹ Weight and balance is for Quick Release Cabin Step only. Mounting beams and attachment provisions are not included since they are included in the basic rotorcraft weight and balance at time of initial installation.

VI INSTALLATION / REMOVAL INSTRUCTIONS

The Quick Release Mounting Provisions are installed in accordance with drawing 95902 (S/N 57001 – 57080) or 95906 (S/N 57081 & sub). The Quick Release Cabin Step is installed in accordance with drawing 96902 (S/N 57001 – 57080) or 96906 (S/N 57081 & sub). If the Quick Release Cabin Step is removed, the Quick Release Cargo Basket must be installed, refer to FMS959.90. Logbook entry indicating installation or removal of step and which weight and balance amendment is in effect is required.

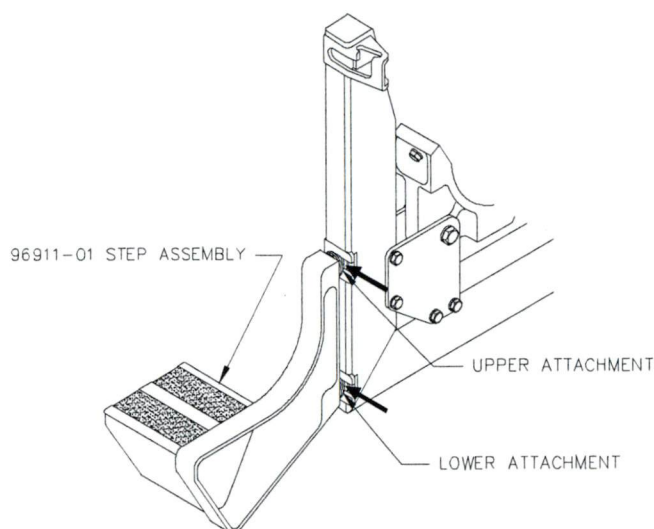


Figure VI.1 – Forward Step Attachment

1. Step Installation - Refer to Figure VI.1 and VI.2.
 1. Slide forward attachments of Quick Release Step Assembly 96911-01 into forward mounting beam.
 2. At aft end, rotate step inboard and pull step aft to aft mounting beam. Align attachment fittings on step with keyways, push step in and down to engage attachments into keyways on aft beam. Pin at lower attachment will spring into place with a snap.
 3. Check that step is secure by pulling up on aft end.

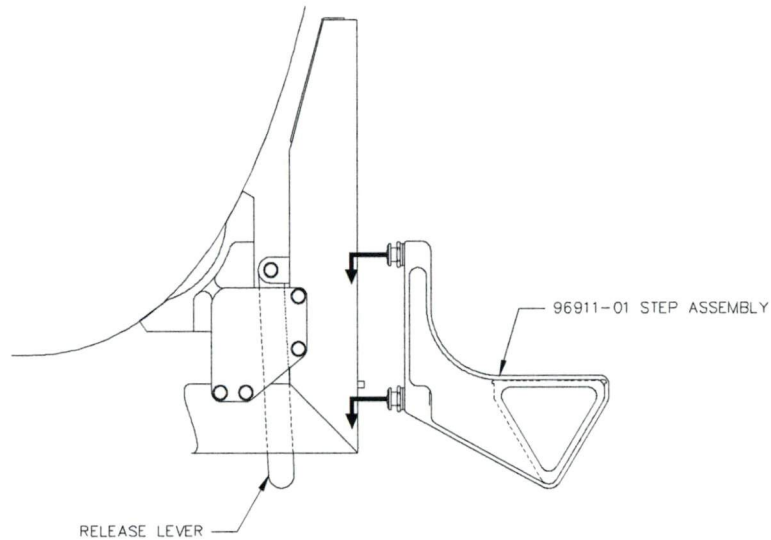


Figure VI.2 – Aft Step Attachment

2. Step Removal - Refer to Figure VI.1 and VI.2.

1. Pull lever at bottom end of aft beam inboard to retract retaining pin and lift step until lower attachment fitting is free of keyway. Keep upper attachment in slot in beam.
2. Lift step until upper attachment is out of keyway on aft beam. Slide step forward and rotate aft end outboard until forward attachments are free from keyways in forward beam.

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
95902	Mounting Provisions Installation (S/N 57001 – 57080)	1
95906	Mounting Provisions Installation (S/N 57081 & Sub.)	0
95907	External Attachment Provisions Installation (S/N 57081 & Sub.)	0
FMS959.90	Flight Manual Supplement	2
ICA959.91	Instructions for Continued Airworthiness	1
FABRICATION DOCUMENTS		
DCL959-12	Document Control List for Mounting Provisions Fabrication (S/N 57001 – 57080)	1
DCL959-16	Document Control List for Mounting Provisions Fabrication (S/N 57081 & Sub.)	0

APPROVAL: <div style="display: flex; align-items: center;"> <div> <p style="font-size: small;">Transport Canada Transports Canada</p> <p style="font-weight: bold; margin: 5px 0;">AIRCRAFT CERTIFICATION DIVISION</p> <p style="font-weight: bold; margin: 5px 0;">APPROVED</p> <p>By <u><i>[Signature]</i></u></p> <p>Appr'l No. <u>SH12-58</u></p> <p>Appr'l Date <u>2012-11-16</u></p> <p>Issue No. <u>3</u></p> <p>Issue Date <u>2014-12-03</u></p> <p style="font-size: x-small; text-align: center;">YY - MM - DD</p> </div> </div>		<p>ORIGINAL DATE: 28 September 2012</p> <p>REVISION DATE: 12 September 2014</p>	<p>Aero Design Ltd.</p> <p style="font-size: small;">9888A Malaspina Road Powell River, BC, Canada, V8A 0G3 Tel: 604.483.2376 www.aerodesign.ca</p>
<p style="text-align: center;">SHEET 1 OF 1</p>		<p>Bell 429</p> <p>Quick Release Cargo Basket</p> <p>Mounting Provisions Installation</p>	
<h2 style="margin: 0;">DCL959-2</h2>		<p style="font-size: small;">Rev.</p> <h2 style="margin: 0;">2</h2>	

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
FABRICATION DOCUMENTS		
95920	Forward Fitting Fabrication	1
95921	Aft Fitting Fabrication	1
95922	Plates Fabrication	1
95923	Bushings Fabrication	1
95930	Forward Beam Fabrication	1
95931	Aft Beam Fabrication	1
ENGINEERING DOCUMENTS		
ER959.01	Engineering Report	0
ER959.02	Engineering Report	0
ER842.01	Engineering Report	0
	Flight Test Report – Transport Canada	

APPROVAL: <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <div style="display: inline-block; text-align: center;"> <small>Transport Canada</small> </div> <div style="display: inline-block; text-align: center;"> <small>Transports Canada</small> </div> </div> <div style="margin-top: 10px;"> AIRCRAFT CERTIFICATION DIVISION APPROVED By <u><i>[Signature]</i></u> App'l No. <u>SH12-058</u> App'l Date <u>2012-11-16</u> Issue No. <u>3</u> Issue Date <u>2014-12-03</u> <small>YY - MM - DD</small> </div>	ORIGINAL DATE: 28 September 2012 REVISION DATE: 12 September 2014	<div style="text-align: center;"> Aero Design Ltd. <small>9888A Malaspina Road Powell River, BC, Canada, V8A 0G3 Tel: 604.483.2376 www.aerodesign.ca</small> </div> <div style="text-align: center; margin-top: 10px;"> Bell 429 (S/N 57001 – 57080) Quick Release Cargo Basket Mounting Provisions Fabrication </div> <div style="display: flex; justify-content: space-between; align-items: center; margin-top: 20px;"> <div style="text-align: center; flex-grow: 1;"> SHEET 1 OF 1 <div style="font-size: 2em; font-weight: bold; margin-top: 20px;">DCL959-12</div> </div> <div style="text-align: center; width: 15%;"> Rev. <div style="font-size: 2em; font-weight: bold; margin-top: 20px;">1</div> </div> </div>
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DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
FABRICATION DOCUMENTS		
95940	Lug Fabrication	0
95942	Plates Fabrication	0
95923	Bushings Fabrication	1
95932	Forward Beam Fabrication	0
95933	Aft Beam Fabrication	0
ENGINEERING DOCUMENTS		
ER959.01	Engineering Report	0
ER959.02	Engineering Report	0
ER842.01	Engineering Report	0
	Flight Test Report – Transport Canada	
ER959.03	Engineering Report	0
TR959.04	Test Plan and Report – Lug	0
TR959.05	Test Plan and Report – Lid and Forward Panels	0

APPROVAL: <div style="display: flex; align-items: center;"> <div> <p style="font-size: small;">Transport Canada Transports Canada</p> <p style="text-align: center;">AIRCRAFT CERTIFICATION DIVISION</p> <p style="text-align: center; font-weight: bold; font-size: large;">APPROVED</p> <p>By <u><i>[Signature]</i></u></p> <p>Appr'l No. <u>5H12-58</u></p> <p>Appr'l Date <u>2012-11-16</u></p> <p>Issue No. <u>3</u></p> <p>Issue Date <u>2014-12-03</u></p> <p style="font-size: x-small; text-align: center;">YY - MM - DD</p> </div> </div>		<p>ORIGINAL DATE: 12 September 2014</p> <p>REVISION DATE:</p>	<div style="text-align: center;"> <p>Aero Design Ltd.</p> <p style="font-size: x-small;">9888A Malaspina Road Powell River, BC, Canada, V8A 0G3 Tel: 604.483.2376 www.aerodesign.ca</p> </div>
<p>SHEET 1 OF 1</p>		<p>Bell 429 (S/N 57081 & Sub.)</p> <p>Quick Release Cargo Basket</p> <p>Mounting Provisions Fabrication</p>	
<h2 style="margin: 0;">DCL959-16</h2>		<p>Rev.</p> <h2 style="margin: 0;">0</h2>	

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
95901	Quick Release Cargo Basket Installation (S/N 57001 – 57080)	1
95905	Quick Release Cargo Basket Installation (S/N 57081 & Sub.)	0
FMS959.90	Flight Manual Supplement	2
ICA959.91	Instructions for Continued Airworthiness	1
FABRICATION DOCUMENTS		
DCL959-11	Document Control List for Basket Fabrication (S/N 57001 – 57080)	1
DCL959-15	Document Control List for Basket Fabrication (S/N 57081 & Sub.)	0

APPROVAL: <div style="display: flex; align-items: center;"> <div> <p style="font-size: small;">Transport Canada Transports Canada</p> <p style="text-align: center;">AIRCRAFT CERTIFICATION DIVISION</p> <p style="text-align: center; font-weight: bold; font-size: large;">APPROVED</p> <p>By <u><i>[Signature]</i></u></p> <p>Appr'l No. <u>SH12 58</u></p> <p>Appr'l Date <u>2012-11-16</u></p> <p>Issue No. <u>3</u></p> <p>Issue Date <u>2014-12-03</u></p> <p style="font-size: x-small; text-align: center;">YY - MM - DD</p> </div> </div>		<p>ORIGINAL DATE: 28 September 2012</p> <p>REVISION DATE: 12 September 2014</p>	<div style="text-align: center;"> Aero Design Ltd. <small>9888A Malaspina Road Powell River, BC, Canada, V8A 0G3 Tel: 604.483.2376 www.aerodesign.ca</small> </div>
<div style="display: flex; justify-content: space-between;"> <div style="width: 40%;"> <p>SHEET 1 OF 1</p> </div> <div style="width: 60%; text-align: center;"> <p>Bell 429</p> <p>Quick Release Cargo Basket Installation</p> </div> </div>		<p>Rev.</p>	
<h2 style="margin: 0;">DCL959-1</h2>		<h2 style="margin: 0;">2</h2>	

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
FABRICATION DOCUMENTS		
95910	Cargo Basket Assembly	1
95911	Basket Fabrication	1
95912	Lid Fabrication	1
95915	Basket Components - Forward Sheet	1
95916	Basket Components - Filler Sheets	1
95917	Basket Components - Lid Checker Plate	1
95925	Basket Components - Forward Attachment Hoop	1
95926	Basket Components - Aft Attachment Hoop	1
95927	Basket Components - Placard	1
94520	Basket Components - Hoop	1
49215	Basket Components - Spacer	1
49216	Basket Components - Spacer	1
84240	Lid Brace Installation	0
84255	Handle Assembly	2
84261	Handle Bar Assembly	2
84262	Basket Handle Provisions Assembly	2
84263	Lid Handle Provisions Assembly	0
84265	Handle Lever	2
84267	Handle Bracket	1
84272	Bushing	1
36273	Lid Bracket	2
36274	Bushing	3
36275	Bushing	4
36277	Handle Bar	1
36278	Spring	3
36280	Brace	3
ENGINEERING DOCUMENTS		
ER959.01	Engineering Report	0
ER959.02	Engineering Report	0
ER842.01	Engineering Report	0
	Flight Test Report – Transport Canada	

APPROVAL:

 Transport Canada	 Transports Canada
AIRCRAFT CERTIFICATION DIVISION	
APPROVED	
By <u><i>[Signature]</i></u>	
Appr'l No. <u>SH12658</u>	
Appr'l Date <u>2012-11-16</u>	
Issue No. <u>3</u>	
Issue Date <u>2014-12-03</u> <small>YY - MM - DD</small>	

ORIGINAL DATE:
28 September 2012

REVISION DATE:
12 September 2014



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Tel: 604.483.2376 www.aerodesign.ca

SHEET 1 OF 1

Bell 429 (S/N 57001 – 57080)
Quick Release Cargo Basket
Basket Fabrication



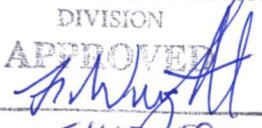
DCL959-11

Rev.

1

DOCUMENT CONTROL LIST


DOCUMENT NO.	DOCUMENT CONTENT	REVISION
FABRICATION DOCUMENTS		
95950	Cargo Basket Assembly	0
95951	Basket Fabrication	0
95912	Lid Fabrication	1
95964	Basket Components - Forward Attachment Hoop	0
95965	Basket Components - Forward Sheet	0
95916	Basket Components - Filler Sheet	1
95917	Basket Components - Lid Sheet	1
95926	Basket Components - Aft Attachment Hoop	1
95927	Basket Components - Placard	1
94520	Basket Components - Hoop	1
49215	Basket Components - Spacer	1
49216	Basket Components - Spacer	1
84240	Lid Brace Installation	0
84255	Handle Assembly	2
84261	Handle Bar Assembly	2
84262	Basket Handle Provisions Assembly	2
84263	Lid Handle Provisions Assembly	0
84265	Handle Lever	2
84267	Handle Bracket	1
84272	Bushing	1
36273	Lid Bracket	2
36274	Bushing	3
36275	Bushing	4
36277	Handle Bar	1
36278	Spring	3
36280	Brace	3
ENGINEERING DOCUMENTS		
ER959.01	Engineering Report	0
ER959.02	Engineering Report	0
ER842.01	Engineering Report	0
	Flight Test Report – Transport Canada	
ER959.03	Engineering Report	0
TR959.04	Test Plan and Report – Lug	0
TR959.05	Test Plan and Report – Lid and Front Panels	0

APPROVAL:	ORIGINAL DATE: 12 September 2014	 Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada, V8A 0G3 Tel: 604.483.2376 www.aerodesign.ca
 Transport Canada Transports Canada AIRCRAFT CERTIFICATION DIVISION APPROVED By  App'l No. <u>SH1258</u> App'l Date <u>2012-11-16</u> Issue No. <u>3</u> Issue Date <u>2014-12-03</u> YY - MM - DD	REVISION DATE:	
SHEET 1 OF 1		Bell 429 (S/N 57081 & Sub.) Quick Release Cargo Basket Basket Fabrication
DCL959-15		Rev. 0

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
96901	Fixed Cabin Step Installation (S/N 57001-57080)	1
96902	Quick Release Cabin Step Installation (S/N 57001-57080)	1
96905	Fixed Cabin Step Installation (S/N 57081 & Sub.)	0
96906	Quick Release Cabin Step Installation (S/N 57081 & Sub.)	0
FMS969.90	Flight Manual Supplement for Quick Release Step	2
ICA969.91	Instructions for Continued Airworthiness	1
FABRICATION DOCUMENTS		
DCL969-11	Document Control List for Step Fabrication	1

APPROVAL:

	Transport Canada	Transports Canada
AIRCRAFT CERTIFICATION DIVISION		
APPROVED		
By <u><i>[Signature]</i></u>		
Appr'l No. <u>SH12-58</u>		
Appr'l Date <u>2012-11-16</u>		
Issue No. <u>3</u>		
Issue Date <u>2014-12-03</u>		
YY-MM-DD		

ORIGINAL DATE:
12 December 2012
REVISION DATE:
12 September 2014



Aero Design Ltd.
9888A Malaspina Road
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Tel: 604.483.2376 www.aerodesign.ca

SHEET 1 OF 1

**Bell 429
Cabin Steps
Installation**

DCL969-1

Rev.



2

Pv

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
FABRICATION DOCUMENTS		
96910	Fixed Step Assembly	1
96911	Quick Release Step Assembly	1
96920	Fixed Step Brackets	1
96921	Quick Release Step Brackets	1
ENGINEERING DOCUMENTS		
ER969.01	Engineering Report	0

APPROVAL:

 Transport Canada	 Transports Canada
AIRCRAFT CERTIFICATION DIVISION	
APPROVED	
By <u><i>[Signature]</i></u>	
Appr'l No. <u>5H12-58</u>	
Appr'l Date <u>2012-11-16</u>	
Issue No. <u>3</u>	
Issue Date <u>2014-12-03</u> <small>YY-MM-DD</small>	

ORIGINAL DATE:
12 December 2012
REVISION DATE:
12 September 2014



Aero Design Ltd.

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Tel: 604.483.2376 www.aerodesign.ca

SHEET 1 OF 1

**Bell 429
Cabin Steps
Fabrication**



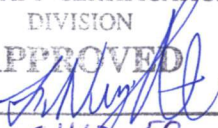

DCL969-11

Rev.

1

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
	INSTALLATION DOCUMENTS	
70408	Installation, Hangar Wheel	1
	FABRICATION DOCUMENTS	
70403	Auxiliary Latch Modification	5
70428	Assembly, Hangar Wheel	1
70438	Parts, Hangar Wheel	1
	ENGINEERING DOCUMENTS	
ER704.02	Engineering Report	0
Note: This DCL is identical to DCL704, Rev. 9, but only includes configurations eligible on the Bell 429.		

APPROVAL:  Transport Canada  Transports Canada AIRCRAFT CERTIFICATION DIVISION APPROVED By  Appr'l No. <u>SH12-58</u> Appr'l Date <u>2012-11-16</u> Issue No. <u>3</u> Issue Date <u>2014-12-03</u> YY - MM - DD	ORIGINAL DATE: 24 July 2013 REVISION DATE: 12 September 2014	 Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada, V8A 0G3 Tel: 604.483.2376 www.aerodesign.ca	
	SHEET 1 OF 1	Bell 429 Cargo Basket Modifications	
	DCL704-429		Rev. 1

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

APPENDIX A-3 NORMAL CATEGORY ROTORCRAFT – CAR 527

BLOCK 1

Name of the applicant for the design change approval:	Aero Design Ltd.
Description of the design change:	Installation of Quick Release Cargo Baskets on Bell 429
Certification Basis of design change and revision date:	CAR 527, Change 527-9
CAR Standard A527.1(c) Program showing how changes to supplemental ICA made by the applicant or by the manufacturers of products and appliances installed in the aeroplane pursuant to the design change will be distributed:	Section 0-3 of Supplemental ICA (ICA 969.91)
CAR Standard 513.05 (1) (g) (iv): Installation Instructions:	Installation Drawing 96901, 96902, 96905, 96906

Rev 1
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BLOCK 2

Note: Enter "N/A" when no supplemental ICA are needed.

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.2 (a) Manual(s) (a) The Instructions for Continued Airworthiness must be in the form of a manual or manuals as appropriate for the quantity of data to be provided.	ICA ref: Bell 429 Maintenance Manual, BHT-429-MM	Supplemental ICA ref: Single Manual (ICA969.91)
A527.2 (b) Practical arrangement (b) The format of the manual or manuals must provide for a practical arrangement.	ICA ref: Bell 429 Maintenance Manuals	Supplemental ICA ref: Arranged in ATA format
A527.3 The Instructions for Continued Airworthiness must contain the following manuals or sections, as appropriate, and information:		
A527.3 (a) Rotorcraft maintenance manual or section		
A527.3 (a) (1) (Introduction) (1) Introduction information that includes an explanation of the rotorcraft's features and data to the extent necessary for maintenance or preventive maintenance.	ICA ref: Bell 429 Maintenance Manual, Chapter 1	Supplemental ICA ref: Section 0-1
A527.3 (a) (2) (Description) (2) A description of the rotorcraft and its systems and installations including its engines, rotors, and appliances.	ICA ref: Bell 429 Maintenance Manual, Chapter 1	Supplemental ICA ref: Section 0-5

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.3 (a) (3) Control & Operation (3) Basic control and operation information describing how the rotorcraft components and systems are controlled and how they operate, including any special procedures and limitations that apply.	ICA ref: N/A	Supplemental ICA ref: N/A
A527.3 (a) (4) Servicing (4) Servicing information that covers details regarding servicing points, capacities of tanks, reservoirs, types of fluids to be used, pressures applicable to the various systems, location of access panels for inspection and servicing, locations of lubrication points, lubricants to be used, equipment required for servicing, tow instructions and limitations, mooring, jacking, and levelling information.	ICA ref: Bell 429 Maintenance Manual, Chapter 12	Supplemental ICA ref: N/A
A527.3 The Instructions for Continued Airworthiness must contain the following manuals or sections, as appropriate, and information:		
A527.3 (b) Maintenance Instructions.		
A527.3 (b) (1) Scheduling 1) Scheduling information for each part of the rotorcraft and its engines, auxiliary power units, rotors, accessories, instruments, and equipment that provides the recommended periods at which they should be cleaned, inspected, adjusted, tested, and lubricated, and the degree of inspection, the applicable wear tolerances, and work recommended at these periods. However, the applicant may refer to an accessory, instrument, or equipment manufacturer as the source of this information if the applicant shows that the item has an exceptionally high degree of complexity requiring specialized maintenance techniques, test equipment, or expertise. The recommended overhaul periods and necessary cross-references to the Airworthiness Limitations section of the manual must also be included. In addition, the applicant must include an inspection program that includes the frequency and extent of the inspections necessary to provide for the continued airworthiness of the rotorcraft.	ICA ref: Bell 429 Maintenance Manual, Chapter 5	Supplemental ICA ref: Section 5-1
A527.3 (b) (2) Troubleshooting (2) Troubleshooting information describing probable malfunctions, how to recognize those malfunctions, and the remedial action for those malfunctions.	ICA ref: N/A	Supplemental ICA ref: N/A

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.3 (b) (3) Removal/replacement (3) Information describing the order and method of removing and replacing products and parts with any necessary precautions to be taken.	ICA ref: Bell 429 Maintenance Manual, Chapter 25	Supplemental ICA ref: Section 32-1 thru 32-4
A527.3 (b) (4) General (4) Other general procedural instructions including procedures for system testing during ground running, symmetry checks, weighing and determining the center of gravity, lifting and shoring, and storage limitations.	ICA ref: Bell 429 Maintenance Manual, Chapter 7 and 8	Supplemental ICA ref: Section 32-6
A527.3 (c) Access (c) Diagrams of structural access plates and information needed to gain access for inspections when access plates are not provided.	ICA ref: N/A	Supplemental ICA ref: N/A
A527.3 (d) Special inspections (d) Details for the application of special inspection techniques including radiographic and ultrasonic testing where such processes are specified.	ICA ref: Bell 429 Maintenance Manual, Chapter 5	Supplemental ICA ref: Section 5-1
A527.3 (e) Protective treatment (e) Information needed to apply protective treatments to the structure after inspection.	ICA ref: Bell Standard Practices Manual BHT-ALL-SPM, Chapter 3	Supplemental ICA ref: Section 5-3
A527.3 (f) Fasteners, torque values, etc (f) All data relative to structural fasteners such as identification, discard recommendations, and torque values.	ICA ref: Bell Standard Practices Manual BHT-ALL-SPM, Chapter 2	Supplemental ICA ref: Section 32-7
A527.3 (g) Special tools (g) A list of special tools needed.	ICA ref: N/A	Supplemental ICA ref: N/A


MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

BLOCK 3


Note: The statement in block 5 does not constitute an approval of the Airworthiness Limitations Section. Airworthiness Limitations differ from other maintenance tasks, in that they are mandatory, as a direct condition of the approval of the type design. They are therefore referenced directly in the approval document itself. However, they must also be included in the Supplemental Instructions for Continued Airworthiness.

A527.4 AWL - Separate Section 1 The Instructions for Continued Airworthiness must contain a section titled Airworthiness Limitations that is segregated and clearly distinguishable from the rest of the document. This section must set forth each mandatory replacement time, structural inspection interval, and related structural inspection procedure approved under 527.571. If the Instructions for Continued Airworthiness consist of multiple documents, the section required by this paragraph must be included in the principal manual. This section must contain a legible statement in a prominent location that reads: "The Airworthiness Limitations section is approved by the Minister and specifies maintenance required by any applicable airworthiness or operating rule unless an alternative program has been approved by the Minister."	ICA ref: Bell 429 Maintenance Manual, Chapter 4	Supplemental ICA ref: Chapter 4
---	---	---------------------------------

BLOCK 4 – Applicant Statement of Compliance

The Supplemental ICA referenced above comprises the complete listing of supplemental ICA necessary to show compliance with the regulatory standard that supports this change in type design.	
Applicants Signature: <u></u>	Date: <u>15 September 2014</u>
Applicants Name: <u>Jeff Clarke, Vice President</u>	

BLOCK 5 – Minister's Statement of Acceptability

The design change is adequately supported by existing ICA and/or supplemental ICA, as identified above and is acceptable to the Minister.			
Reviewer's Name: <u>JACK STAAL</u>	Phone # <u>780-495-5227</u>	Email: <u>jack.staal@tc.gc.ca</u>	Mail Routing Symbol: <u>RAX1</u>
Signature: <u></u>	Date: <u>3 Dec 2014</u>	NAPA Number: <u>C-14-0212</u> <u>C-14-0978</u> <u>JP</u>	

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

APPENDIX A-3 NORMAL CATEGORY ROTORCRAFT – CAR 527

BLOCK 1

Name of the applicant for the design change approval:	Aero Design Ltd.
Description of the design change:	Installation of Quick Release Cargo Baskets on Bell 429
Certification Basis of design change and revision date:	CAR 527, Change 527-9
CAR Standard A527.1(c) Program showing how changes to supplemental ICA made by the applicant or by the manufacturers of products and appliances installed in the aeroplane pursuant to the design change will be distributed:	Section 0-3 of Supplemental ICA (ICA 959.91)
CAR Standard 513.05 (1) (g) (iv): Installation Instructions:	Installation Drawing 95901, 95902, 95905, 95906, 95907

Rev 1
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BLOCK 2

Note: Enter "N/A" when no supplemental ICA are needed.

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.2 (a) Manual(s) (a) The Instructions for Continued Airworthiness must be in the form of a manual or manuals as appropriate for the quantity of data to be provided.	ICA ref: Bell 429 Maintenance Manual, BHT-429-MM	Supplemental ICA ref: Single Manual (ICA959.91)
A527.2 (b) Practical arrangement (b) The format of the manual or manuals must provide for a practical arrangement.	ICA ref: Bell 429 Maintenance Manuals	Supplemental ICA ref: Arranged in ATA format
A527.3 The Instructions for Continued Airworthiness must contain the following manuals or sections, as appropriate, and information:		
A527.3 (a) Rotorcraft maintenance manual or section		
A527.3 (a) (1) (Introduction) (1) Introduction information that includes an explanation of the rotorcraft's features and data to the extent necessary for maintenance or preventive maintenance.	ICA ref: Bell 429 Maintenance Manual, Chapter 1	Supplemental ICA ref: Section 0-1
A527.3 (a) (2) (Description) (2) A description of the rotorcraft and its systems and installations including its engines, rotors, and appliances.	ICA ref: Bell 429 Maintenance Manual, Chapter 1	Supplemental ICA ref: Section 0-5, 0-6

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.3 (a) (3) Control & Operation (3) Basic control and operation information describing how the rotorcraft components and systems are controlled and how they operate, including any special procedures and limitations that apply.	ICA ref: N/A	Supplemental ICA ref: N/A
A527.3 (a) (4) Servicing (4) Servicing information that covers details regarding servicing points, capacities of tanks, reservoirs, types of fluids to be used, pressures applicable to the various systems, location of access panels for inspection and servicing, locations of lubrication points, lubricants to be used, equipment required for servicing, tow instructions and limitations, mooring, jacking, and levelling information.	ICA ref: Bell 429 Maintenance Manual, Chapter 12	Supplemental ICA ref: N/A
A527.3 The Instructions for Continued Airworthiness must contain the following manuals or sections, as appropriate, and information:		
A527.3 (b) Maintenance Instructions.		
A527.3 (b) (1) Scheduling 1) Scheduling information for each part of the rotorcraft and its engines, auxiliary power units, rotors, accessories, instruments, and equipment that provides the recommended periods at which they should be cleaned, inspected, adjusted, tested, and lubricated, and the degree of inspection, the applicable wear tolerances, and work recommended at these periods. However, the applicant may refer to an accessory, instrument, or equipment manufacturer as the source of this information if the applicant shows that the item has an exceptionally high degree of complexity requiring specialized maintenance techniques, test equipment, or expertise. The recommended overhaul periods and necessary cross-references to the Airworthiness Limitations section of the manual must also be included. In addition, the applicant must include an inspection program that includes the frequency and extent of the inspections necessary to provide for the continued airworthiness of the rotorcraft.	ICA ref: Bell 429 Maintenance Manual, Chapter 5	Supplemental ICA ref: Section 5-1
A527.3 (b) (2) Troubleshooting (2) Troubleshooting information describing probable malfunctions, how to recognize those malfunctions, and the remedial action for those malfunctions.	ICA ref: N/A	Supplemental ICA ref: N/A

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.3 (b) (3) Removal/replacement (3) Information describing the order and method of removing and replacing products and parts with any necessary precautions to be taken.	ICA ref: Bell 429 Maintenance Manual, Chapter 25	Supplemental ICA ref: Section 25-1 thru 25-12
A527.3 (b) (4) General (4) Other general procedural instructions including procedures for system testing during ground running, symmetry checks, weighing and determining the center of gravity, lifting and shoring, and storage limitations.	ICA ref: Bell 429 Maintenance Manual, Chapter 7 and 8	Supplemental ICA ref: Section 25-13
A527.3 (c) Access (c) Diagrams of structural access plates and information needed to gain access for inspections when access plates are not provided.	ICA ref: N/A	Supplemental ICA ref: N/A
A527.3 (d) Special inspections (d) Details for the application of special inspection techniques including radiographic and ultrasonic testing where such processes are specified.	ICA ref: Bell 429 Maintenance Manual, Chapter 5	Supplemental ICA ref: Section 5-1
A527.3 (e) Protective treatment (e) Information needed to apply protective treatments to the structure after inspection.	ICA ref: Bell Standard Practices Manual BHT-ALL-SPM, Chapter 3	Supplemental ICA ref: Section 5-3
A527.3 (f) Fasteners, torque values, etc (f) All data relative to structural fasteners such as identification, discard recommendations, and torque values.	ICA ref: Bell Standard Practices Manual BHT-ALL-SPM, Chapter 2	Supplemental ICA ref: Section 25-14
A527.3 (g) Special tools (g) A list of special tools needed.	ICA ref: N/A	Supplemental ICA ref: N/A

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

BLOCK 3

Note: The statement in block 5 does not constitute an approval of the Airworthiness Limitations Section. Airworthiness Limitations differ from other maintenance tasks, in that they are mandatory, as a direct condition of the approval of the type design. They are therefore referenced directly in the approval document itself. However, they must also be included in the Supplemental Instructions for Continued Airworthiness.

A527.4 AWL - Separate Section 1

The Instructions for Continued Airworthiness must contain a section titled Airworthiness Limitations that is segregated and clearly distinguishable from the rest of the document. This section must set forth each mandatory replacement time, structural inspection interval, and related structural inspection procedure approved under 527.571. If the Instructions for Continued Airworthiness consist of multiple documents, the section required by this paragraph must be included in the principal manual. This section must contain a legible statement in a prominent location that reads: "The Airworthiness Limitations section is approved by the Minister and specifies maintenance required by any applicable airworthiness or operating rule unless an alternative program has been approved by the Minister."

ICA ref: Bell 429 Maintenance Manual,
Chapter 4

Supplemental ICA ref: Chapter 4

BLOCK 4 – Applicant Statement of Compliance

The Supplemental ICA referenced above comprises the complete listing of supplemental ICA necessary to show compliance with the regulatory standard that supports this change in type design.

Applicants Signature: _____

Jeff Clarke

Date: 15 September 2014

Applicants Name: Jeff Clarke, Vice President

BLOCK 5 – Minister's Statement of Acceptability

The design change is adequately supported by existing ICA and/or supplemental ICA, as identified above and is acceptable to the Minister.

Reviewer's Name: *Jack Staal*

Phone # *780-495-5227*

Email: *jack.staal@tc.gc.ca*

Mail Routing Symbol: *RAXI*

Signature: *Jack Staal*

Date: *3 Dec 2014*

NAPA Number: *C-14-0212*

93

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS ICA 959.91

BELL 429

QUICK RELEASE CARGO BASKET

Preface

These Instructions for Continued Airworthiness shall be included in the rotorcraft Maintenance Manual when the Quick Release Cargo Basket installed in accordance with the following Aero Design Ltd. Document Control Lists:

- DCL959-1, Revision 2 (Cargo Basket Installation)
- DCL959-2, Revision 2 (Mounting Provisions Installation)

or later approved revision, is installed.

The information contained herein supplements the information in the basic Maintenance Manual. For Maintenance practices and procedures not contained in these Instructions for Continued Airworthiness refer to the basic Maintenance Manual and its approved supplements.

Revision 1

Date: 04 September 2014

Aero Design Ltd.



9888A Malaspina Road, Powell River, BC, V8A 0G3

Phone: 604-483-2376

Fax: 604-483-2372

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RECORD OF REVISIONS

Revision Number	Issue Date	Date Inserted	By
0	28 Sept 2012		Original Issue
1	04 Sept 2014		

LIST OF EFFECTIVE PAGES

List of Revisions	Revision 0 (Original Issue)	28 September 2012
	Revision 1	04 September 2014

List of Effective Pages

<u>Description</u>	<u>Pages</u>	<u>Revision No.</u>
Cover	1	1
Revision Record/List of Effective Pages	2	1
Table of Contents	3	1
00-00-00	4-5	1
04-00-00	6	0
05-00-00	7	1
	8-9	0
	10-11	1
11-00-00	12	1
25-50-00	13	0
	14-31	1

NOTE

Revised text is indicated by a black vertical line. A revised page with only a vertical line next to the page number indicates that text has shifted or that non-technical correction(s) were made on that page. Insert latest revision pages; dispose of superseded pages.

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CHAPTER 0 – INTRODUCTION

0-1 SCOPE

The following Instructions for Continued Airworthiness (ICA) satisfy the requirements of Canadian Aviation Regulations (CAR) 527.1529, and provide the information necessary to complete the on-going maintenance and inspections required for rotorcraft embodying the Quick Release Cargo Basket as described herein.

0-2 DEFINITIONS AND ABBREVIATIONS

ICA - Instructions for Continued Airworthiness

LH - Left Hand

RH - Right Hand

0-3 DISTRIBUTION

Copies of this ICA and amendments shall be distributed to all known purchasers of the Quick Release Cargo Basket. Requests for a copy may be made in writing to:

Aero Design Ltd.
9888A Malaspina Road
Powell River, BC, Canada
V8A 0G3
Email: info@aerodesign.ca

Any changes will be sent to Transport Canada. All changes will be recorded in the Record of Revisions page at the front of this document.

0-4 COMPATIBILITY

Prior to incorporating this modification, the installer shall establish that the inter-relationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the helicopter.

This installation is not compatible with float installations.

This installation is not compatible with the wheel landing gear (WLG) configuration.

0-5 GENERAL DESCRIPTION

The cargo basket is installed in accordance with drawing 95901 or 95905. The basket is 97" long, 25.5" wide, and 18.25" high (2464 mm, 648 mm, 464 mm respectively), and is made of a steel welded tubing structure, lined with expanded steel mesh. The basket has a hinged lid with a locking handle and secondary automatic safety catch.

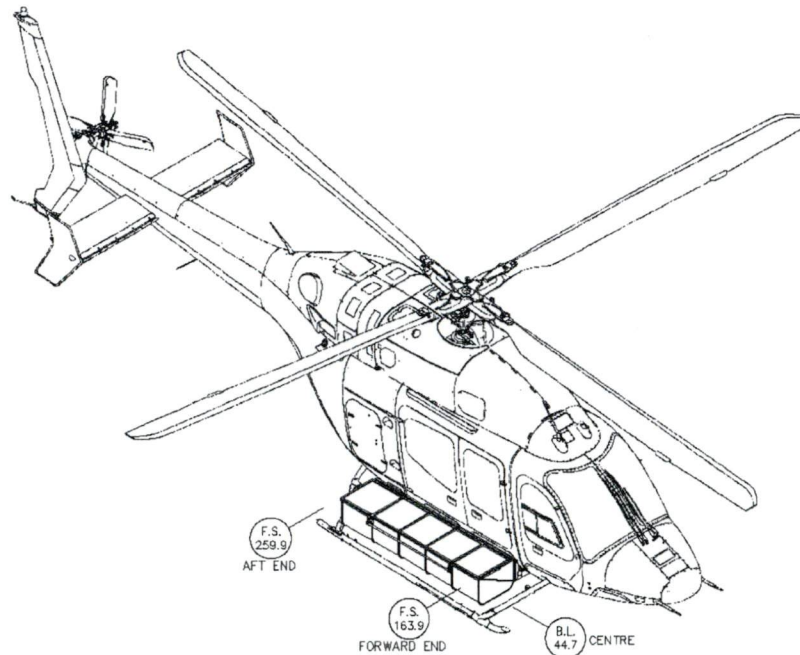


Figure 0.1 – Cargo Basket Installation

0-6 STRUCTURAL PROVISIONS

The Attachment Provisions are installed on the helicopter in accordance with drawing 95902, or 95906 and 95907. The attachment provisions consist of four fittings that are installed on the helicopter mounting locations for the cabin step, which is removed from both sides.

The beams are stainless steel tubing which attach to the fittings on the fuselage and stick out from the side of the helicopter. The quick release mechanism is built into the beams. It allows for the installation and removal of the basket quickly without tools, leaving the mounting beams in place.

CHAPTER 4 - AIRWORTHINESS LIMITATIONS

Transport Canada

The Airworthiness Limitations section is approved by the Minister and specifies maintenance required by any applicable airworthiness or operating rule unless an alternative program has been approved by the Minister.

FAA

The Airworthiness Limitations section is FAA approved and specifies inspections and other maintenance required under Secs. 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

EASA

The Airworthiness Limitations section is approved and variations must also be approved.

No additional airworthiness limitations have been imposed due the installation of the Quick Release Cargo Basket.

CHAPTER 5 – INSPECTION REQUIREMENTS

5-1 INSPECTION SCHEDULE

Continued airworthiness is contingent upon compliance with the following inspection items. These items shall be completed in conjunction with the rotorcraft Maintenance Inspection schedule, or other approved program, or upon removal and replacement of any component of Quick Release Cargo Basket.

Daily Inspection

1. Inspection Area: Basket

- a) Inspect the basket attachment to the beams for condition and security. Ensure quick release mechanism is completely extended, flush with the outboard surface of the beam. If pin does not completely extend, or spring tension is not sufficient to retain basket, replace spring, refer to section 25-10.
- b) Inspect latching of the lid for correct operation. Replace handle brackets on basket if handle is not retained in latched position, refer to section 25-8. Replace handle springs if handle is not held in towards brackets, refer to section 25-9.

200 Hour or Annual Inspection

1. Inspection Area: Basket

- a) Visually inspect tube-to-tube welds and mesh-to-tube welds for cracks, corrosion or other damage.
- b) Visually inspect basket mesh for damage.
- c) Visually inspect lid prop for condition and operation. Ensure prop does not extend beyond catch and catch extends to hold lid open. Refer to section 25-11 for lid prop replacement.

2. Inspection Area: Beams

- a) Visually inspect beams attaching basket to the helicopter for cracks, corrosion or other damage.
- b) Visually inspect lugs attaching the basket to the beams for security and damage.
- c) Visually inspect plates attaching beams to attachment provisions for cracks, corrosion or other damage.
- d) Visually inspect bolts attaching beams to external attachment provisions for security and damage.

3. Inspection Area: Attachment Provisions

- a) Visually inspect each fitting for cracks, corrosion or other damage.

- b) Visually inspect bolts attaching fittings to fuselage for condition and security.
4. Inspection Area: Forward Cross Tube
- a) Visually inspect condition of erosion tape on forward cross tube, directly forward of cargo basket.

Special Inspections

Following a hard landing inspect the Quick Release Cargo Basket installation in accordance with the 200 hour or annual inspection listed above.

5-2 DAMAGE LIMITS / REPAIR INSTRUCTIONS

If damage is found in the inspections above, repair in accordance with the instructions below.

1. Basket and Lid Tubing

Damage Limits:

- a) Deformation of any tubing between welded joints not exceeding 0.25 inches in any direction must be repaired in accordance with the instructions below.
- b) Corrosion not exceeding 0.015 inches deep to be dressed out to a smooth contour.
- c) Corrosion exceeding 0.015 inches deep to be repaired in accordance with the instructions below.

Repair Instructions:

- a) Repair Basket and Lid tubing in accordance with AC43.13-1B, Chapter 4, Section 5, Welding, paragraphs 4-80, 4-81 and 4-83 as required.

Basket and Lid are fabricated from the following materials:

Basket Hoops, Spine: 1/2" square steel tube

Lid, Basket Rim: 3/4" square steel tube

- b) Touch up with polyurethane paint as required following repairs.

2. Basket Mesh

Damage Limits:

- a) The basket mesh may be deformed or stretched without limit, so long as the welds attaching the mesh to the basket or lid are not compromised. If welds are compromised, repair in accordance with instructions below.
- b) Tears in the mesh not exceeding 4 cells in any direction may be repaired by patching. Maximum one repair patch per bay. See instructions below.

Repair Instructions:

- a) Repair mesh to tube welds in accordance with AC43.13-1B, Chapter 4, Section 5, Welding, as required.

Mesh: $\frac{3}{4}$ " 16 ga. (0.040") expanded steel mesh

- b) Patch repair:

- a. Cut two aluminum sheets, minimum 0.040 inches thick, extending to at least 1 complete cell outside of torn area. Drill #9 holes in the corners of the sheet, located to clear the mesh when installed.
- b. Attach patches, one inside and one outside, to the mesh with AN3 Bolts, AN970-3 Washers, and MS21044N3 Nuts.

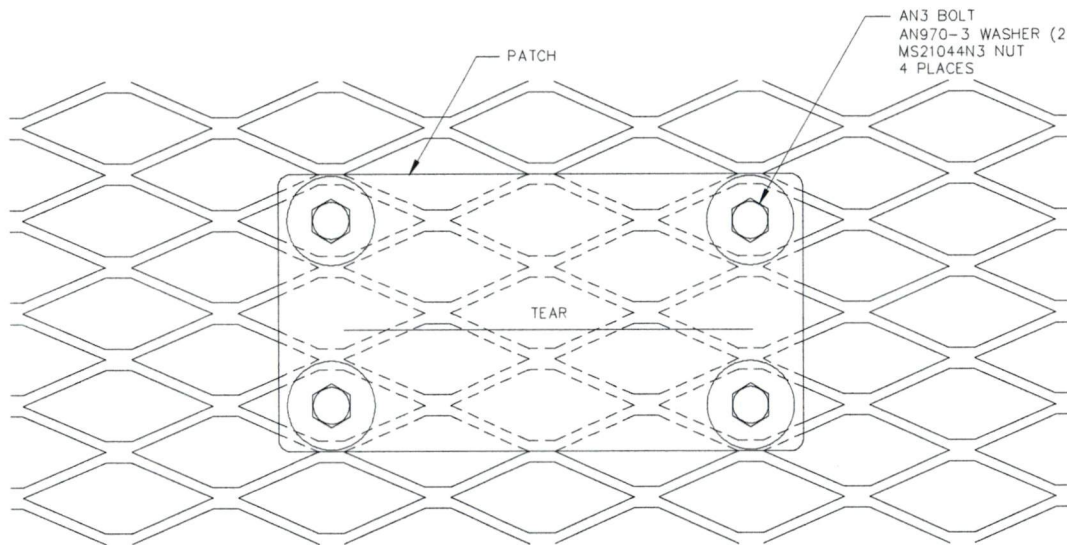


Figure 5.1 – Patch Repair

- c) Touch up with polyurethane paint as required following repairs.

3. Beams

Damage Limits:

- a) Critical slot dimensions are shown in Figure 5.2.

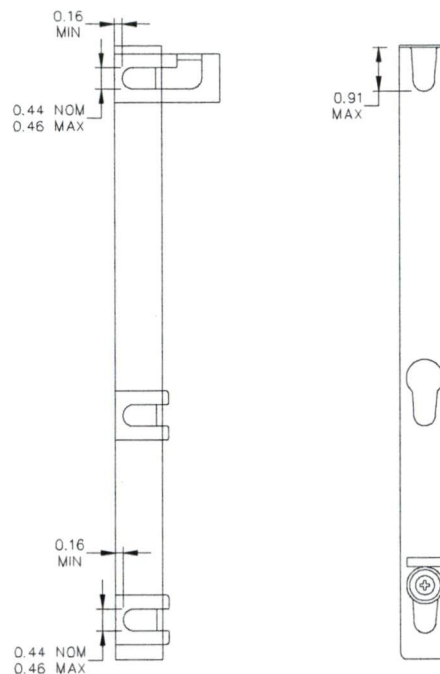


Figure 5.2 – Critical Beam Slot Dimensions

- b) Attempt to insert 15/32 drill shank into bottom end of vertical slot in aft beam. If drill can be inserted, slot is worn beyond limit.
- c) Nicks and/or gouges on the top or bottom faces up to 0.030" deep and 0.125" wide may be dressed out to a smooth contour.
- d) Nicks and/or gouges on the side faces up to 0.060" deep and 0.125" wide may be dressed out to a smooth contour.
- e) Cracks at any location on the beam are not acceptable.
- f) Touch up with polyurethane paint as required following repairs.

Repair Instructions:

Do not repair damage to beams if beyond limits specified. Replace beams in accordance with section 25-7.

4. Mounting Beam Plates*Damage Limits*

- a) Nicks and/or gouges on any surface up to 0.015" deep and 0.125" wide may be dressed out to a smooth contour.
- b) Cracks on any surface are not acceptable.
- c) Corrosion on any surface up to 0.015 deep, not exceeding 1 square inch may be dressed out to a smooth contour.

Repair Instructions

Replace plates if damage exceeds limits above. See section 25-7.

5-3 PROTECTIVE TREATMENT INFORMATION

1. Beams

The beams are supplied powder coated. If the powder coat is damaged, touch up with polyurethane paint in accordance with Bell Standard Procedures Manual, BHT-SPM-ALL, Chapter 4 and Chapter 5.

2. Cargo Basket

The cargo basket is supplied powder coated. If the powder coat is damaged, touch up with polyurethane paint in accordance with Bell Standard Procedures Manual, BHT-SPM-ALL, Chapter 4 and Chapter 5.

3. Attachment Fittings and Plates

The attachment fittings and plates are supplied anodized. If the anodizing is damaged, parts are to be cleaned, primed and painted in accordance with Bell Standard Procedures Manual, BHT-SPM-ALL, Chapter 4 and Chapter 5.

CHAPTER 11 – MARKINGS AND PLACARDS

The following markings and placards are used with the Quick Release Cargo Basket Installation in the locations noted:

a) Located on basket lid:

- a. Basket S/N 95901-01 (right hand) and 95902-01 (left hand), helicopter S/N 57001 through 57080:



- b. Subsequent basket serial numbers:



Serial number break down:

- i. YY: 01 = Right hand, helicopter S/N 57001 through 57080
02 = Left hand, helicopter S/N 57001 through 57080
11 = Right hand, helicopter S/N 57081 and subsequent
12 = Left hand, helicopter S/N 57081 and subsequent
- ii. XX: Sequential number, starting at 01

CHAPTER 25 – EQUIPMENT AND FURNISHINGS**SECTION 50 – CARGO COMPARTMENTS****25-1 CARGO BASKET REMOVAL**

Refer to Figure 25.1 and 25.2.

1. Pull lever at bottom end of aft beam inboard and lift basket until lower attachment fitting is free of keyway. Keep upper basket attachment in slot in beam.
2. Lift basket until upper attachment is out of keyway on aft beam.
3. Slide basket forward and rotate aft end outboard until lower forward attachment on basket is free from keyway in forward beam.
4. Lower aft end of basket to the ground.
5. At forward end of basket, raise basket until upper attachment is free of keyway. Remove basket from helicopter.

25-2 CARGO BASKET INSTALLATION

Refer to Figure 25.1 and 25.2.

1. Hook upper forward attachment on basket into upper keyway in forward mounting beam.
2. Lift basket from aft end, slide lower forward attachment on basket into lower keyway on forward beam, and pull basket aft while rotating basket towards helicopter to seat attachments in forward beam.

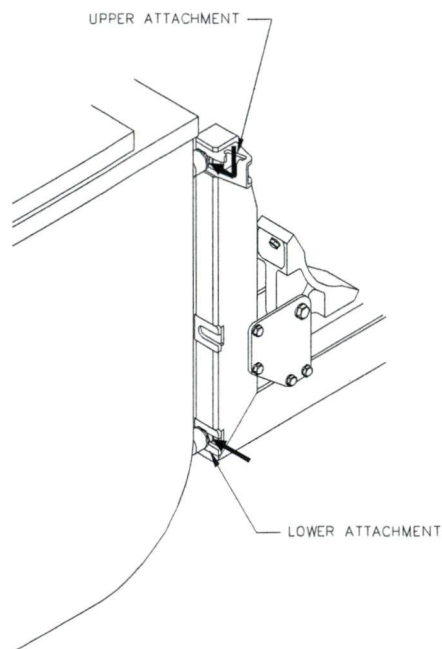


Figure 25.1 – Basket Forward Attachment

3. Lift basket to aft mounting beam, and engage aft attachments into keyways in aft beam.

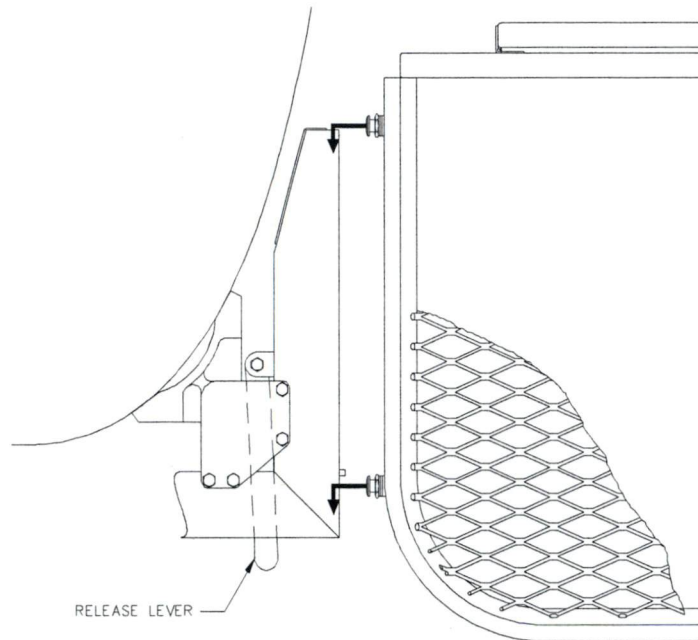


Figure 25.2 – Basket Aft Attachment

4. Push basket down to lock basket into aft beam. Pin will spring into place with a snap.
5. Check that basket is locked in place by attempting to lift aft end of basket.
6. Install abrasion strip on forward cross tube. See section 25-7.

25-3 MOUNTING BEAMS REMOVAL

A) *Helicopter S/N 57001 through 57080.* Refer to Figure 25.3 and 25.4.

1. Remove Cargo Basket. Refer to section 25-1.
2. At aft mounting beam, remove AN4-16A Bolt, NAS1149F0463P Washer (2) and MS21044N4 Nut that attach 95922-01 Plates or 94942-01 Plates on mounting beam to attachment fitting on basket side of beam. Lower beam to ground. Remove AN4-16A Bolt, NAS1149F0463 Washer (2) and MS21044N4 Nut that attach remaining 95922-02 Plates to attachment fitting on opposite side. Remove 95931-01-00 Aft Beam from helicopter.
3. At forward mounting beam, remove AN4-16A Bolt, NAS1149F0463 Washer (2) and MS21044N4 Nut that attach 95922-01 Plates on mounting beam to attachment fitting on basket side of beam. Lower beam to ground. Remove AN4-16A Bolt, NAS1149F0463 Washer (2) and MS21044N4 Nut that attach remaining 95922-02 plates to attachment fitting on opposite side. Remove 95930-01-01/-02 Forward Beam from helicopter.
4. Remove four 95923-01 Bushings from attachment fittings.
5. Hardware, bushings, and plates may be removed from beams prior to storage.

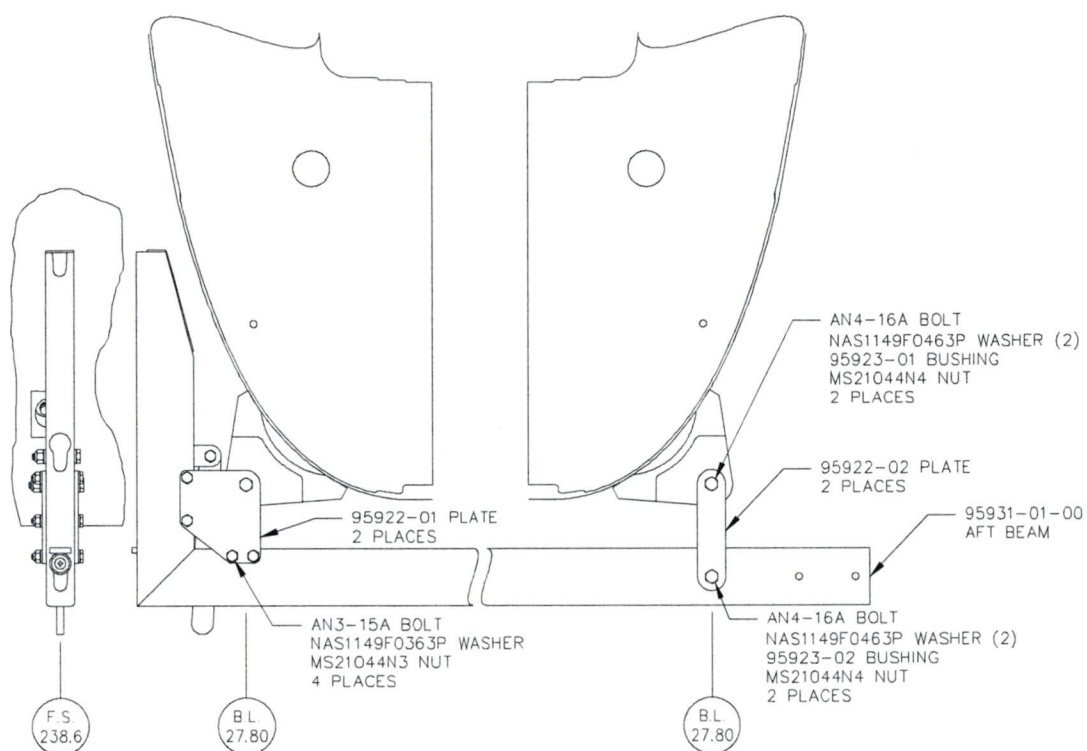


Figure 25.3 – Aft Beam Removal / Installation – S/N 57001 - 57080

Looking Aft, Right Hand Installation Shown

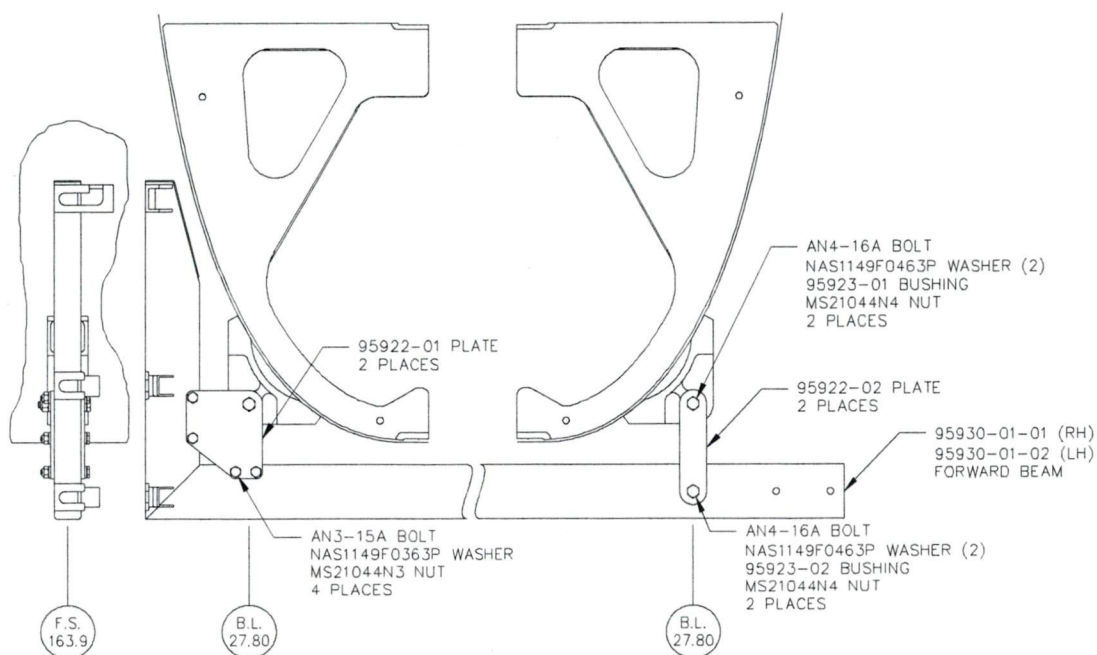


Figure 25.4 – Forward Beam Removal / Installation – S/N 57001 - 57080

Looking Aft, Right Hand Installation Shown

B) *Helicopter S/N 57081 and subsequent.* Refer to Figure 25.5 and 25.6.

1. Remove Cargo Basket. Refer to section 25-1.
2. At aft mounting beam, remove AN4-16A Bolt, NAS1149F0463P Washer (2) and MS21044N4 Nut that attach 94942-01 Plates on mounting beam to attachment fitting on basket side of beam. Lower beam to ground. Remove AN4-16A Bolt, NAS1149F0463 Washer (2) and MS21044N4 Nut that attach remaining 95942-02 Plates to attachment fitting on opposite side. Remove 95933-01-00 Aft Beam from helicopter.
3. At forward mounting beam, remove AN4-16A Bolt, NAS1149F0463 Washer (2) and MS21044N4 Nut that attach 95942-01 Plates on mounting beam to attachment fitting on basket side of beam. Lower beam to ground. Remove AN4-16A Bolt, NAS1149F0463 Washer (2) and MS21044N4 Nut that attach remaining 95942-02 Plates to attachment fitting on opposite side. Remove 95932-01-01/-02 Forward Beam from helicopter.
4. Remove four 95923-01 Bushings from attachment fittings.
5. Hardware, bushings, and plates may be removed from beams prior to storage.

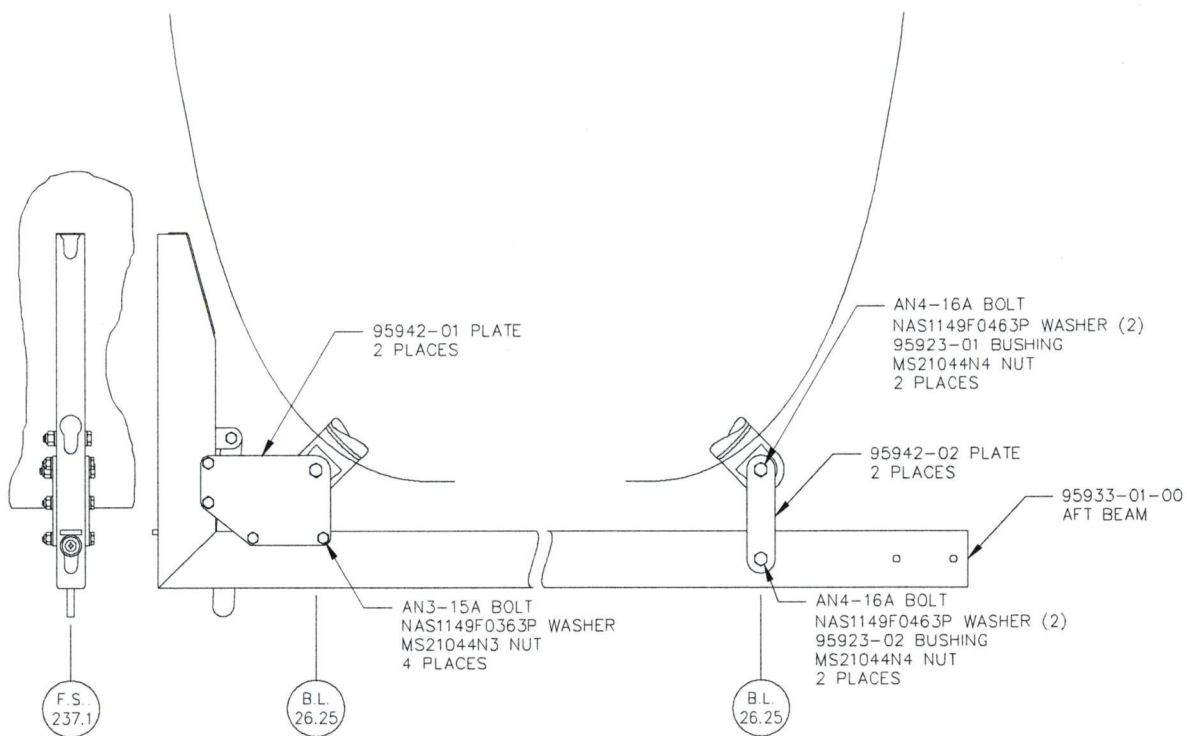


Figure 25.5 – Aft Beam Removal / Installation – S/N 57081 & Sub.

Looking Aft, Right Hand Installation Shown

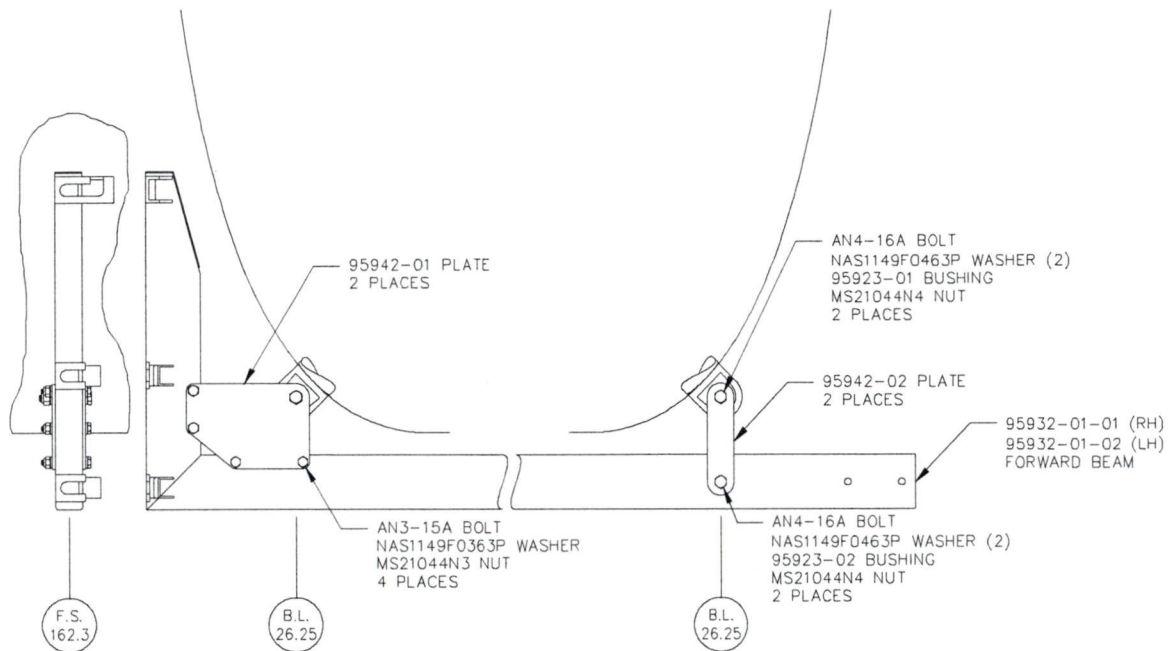


Figure 25.6 – Forward Beam Removal / Installation – S/N 57081 & sub.
Looking Aft, Right Hand Installation Shown

25-4 MOUNTING BEAMS INSTALLATION

A) *Helicopter S/N 57001 through 57080.* Refer to Figure 25.3 and 25.4.

1. Attachment Provisions installed in accordance with section 25-6A are required prior to installing the Mounting Beams.
2. Install two 95922-01 Plates on 95930-01-01/-02 Forward Beam and 95931-01-00 Aft Beam using four AN3-15A Bolt, NAS1149F0363P Washer (2), and MS21044N3 Nut. Torque nuts to 20-25 inch-lbs (2-3 N-m).
3. Install two 95922-02 Plates on 95930-01-01/-02 Forward Beam and 95931-01-00 Aft Beam using one AN4-16A Bolt, NAS1149F0463P Washer (2), 95923-02 Bushing and MS21044N4 Nut. Do not tighten nuts, plates must be free to move.
4. Insert four 95923-01 Bushing in each attachment fitting on fuselage.
5. Raise forward beam up to forward attachment fitting on helicopter, opposite to basket side. Attach 95922-02 Plates to fitting using one AN4-16A Bolt, NAS1149F0463 Washer (2), and MS21044N4 Nut through 95923-01 Bushing. Leave opposite end resting on ground.
6. Raise forward beam up to opposite attachment fitting. Attach 95922-01 Plates to fitting using one AN4-16A Bolt, NAS1149F0463 Washer (2), and MS21044N4 Nut through 95923-01 Bushing.
7. Raise aft beam up to aft attachment fitting on helicopter, opposite to basket side. Attach 95922-02 Plates to fitting using one AN4-16A Bolt, NAS1149F0463 Washer

(2), and MS21044N4 Nut through 95923-01 Bushing. Leave opposite end resting on ground.

8. Raise aft beam up to opposite attachment fitting. Attach 95922-01 Plates to fitting using one AN4-16A Bolt, NAS1149F0463 Washer (2), and MS21044N4 Nut through 95923-01 Bushing.
9. Torque MS21044N4 nuts to 50-70 inch-lbs (6-8 N-m).

B) *Helicopter S/N 57081 and subsequent.* Refer to Figure 25.5 and 25.6.

1. Attachment Provisions installed in accordance with section 25-6B are required prior to installing the Mounting Beams.
2. Install two 95922-01 Plates on 95930-01-01/-02 Forward Beam and 95931-01-00 Aft Beam using four AN3-15A Bolt, NAS1149F0363P Washer (2), and MS21044N3 Nut. Torque nuts to 20-25 inch-lbs (2-3 N-m).
3. Install two 95922-02 Plates on 95930-01-01/-02 Forward Beam and 95931-01-00 Aft Beam using one AN4-16A Bolt, NAS1149F0463P Washer (2), 95923-02 Bushing and MS21044N4 Nut. Do not tighten nuts, plates must be free to move.
4. Insert four 95923-01 Bushing in each attachment fitting on fuselage.
5. Raise forward beam up to forward attachment fitting on helicopter, opposite to basket side. Attach 95922-02 Plates to fitting using one AN4-16A Bolt, NAS1149F0463 Washer (2), and MS21044N4 Nut through 95923-01 Bushing. Leave opposite end resting on ground.
6. Raise forward beam up to opposite attachment fitting. Attach 95922-01 Plates to fitting using one AN4-16A Bolt, NAS1149F0463 Washer (2), and MS21044N4 Nut through 95923-01 Bushing.
7. Raise aft beam up to aft attachment fitting on helicopter, opposite to basket side. Attach 95922-02 Plates to fitting using one AN4-16A Bolt, NAS1149F0463 Washer (2), and MS21044N4 Nut through 95923-01 Bushing. Leave opposite end resting on ground.
8. Raise aft beam up to opposite attachment fitting. Attach 95922-01 Plates to fitting using one AN4-16A Bolt, NAS1149F0463 Washer (2), and MS21044N4 Nut through 95923-01 Bushing.
9. Torque MS21044N4 nuts to 50-70 inch-lbs (6-8 N-m).

25-5 ATTACHMENT FITTINGS REMOVAL

A) *Helicopter S/N 57001 through 57080.* Refer to Figure 25.7.

1. Mounting Beams must be removed prior to removal of the Attachment Fittings. See section 25-3A.
2. Remove the following access covers on both sides in accordance with Bell 429 Maintenance Manual, BHT-429-MM-1, Chapter 53:
 - a. Access Cover, station 184.0 (300AL and 300AR)
 - b. Access Cover, station 224.0 (300BL and 300BR)

3. Remove NAS6603-10 and NAS6603-13 Bolts, NAS1149F0332P Washer (2), and MS21044N3 Nuts from 95921-01 Forward Attachment Fittings. Remove fittings from helicopter.
4. Remove NAS6603-13 and NAS6603-15 Bolts, NAS1149F0332P and NAS1149F0363P Washers, and MS21044N3 Nuts from 95921-01 Aft Right Fitting and 95921-02 Aft Left Fitting. Remove fittings from helicopter.

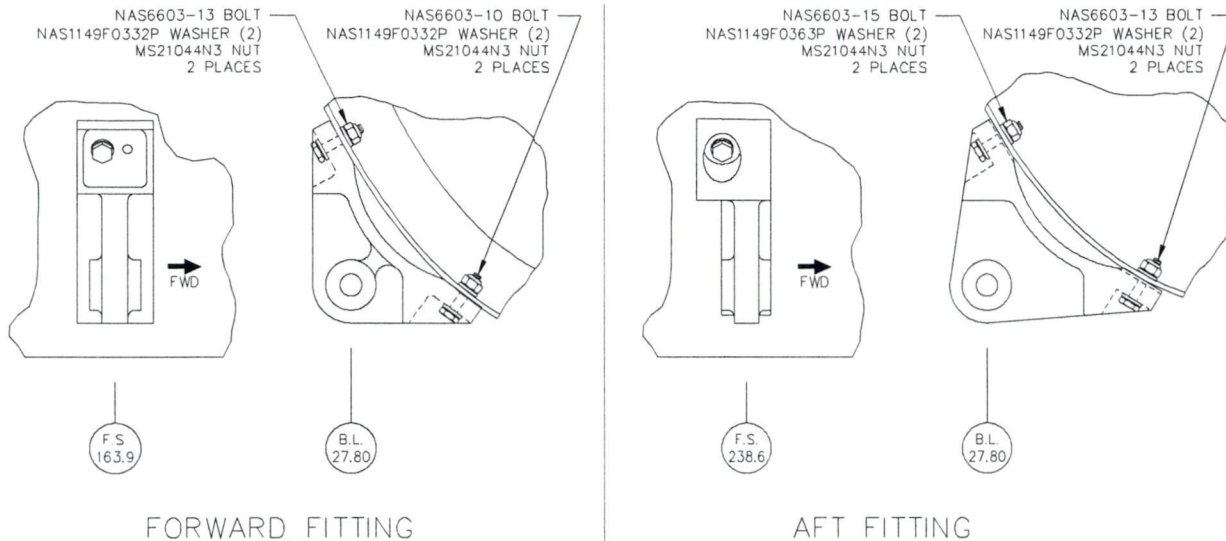


Figure 25.7 – Attachment Fittings Removal / Installation – S/N 57001 - 57080
(Right side shown, left side opposite)

B) *Helicopter S/N 57081 and subsequent. Refer to Figure 25.8.*

1. Mounting Beams must be removed prior to removal of the Attachment Lugs. See section 25-3B.
2. Remove the following access covers on both sides in accordance with Bell 429 Maintenance Manual, BHT-429-MM-1, Chapter 53:
 - a. Access Cover, station 184.0 (300AL and 300AR)
 - b. Access Cover, station 224.0 (300BL and 300BR)
3. Forward lugs: Remove two NAS6605L32 Bolts, NAS1149D0532J and NAS1149D0563J Washers, and MS21042L5 Nuts retaining 95940-01 (RH) and 95940-02 (LH) Forward Lugs in socket fittings. Remove lugs from helicopter.
4. Centre plugs: Remove two MS24665-132 Cotter Pins, MS141445L5 Nuts and NAS1149D0532J Washers from 429-706-074-115 Studs. Remove 429-706-074-119 Shear Pin. Remove studs from socket fittings. Remove 95940-05 (RH) and 95940-06 (LH) Plugs from helicopter.

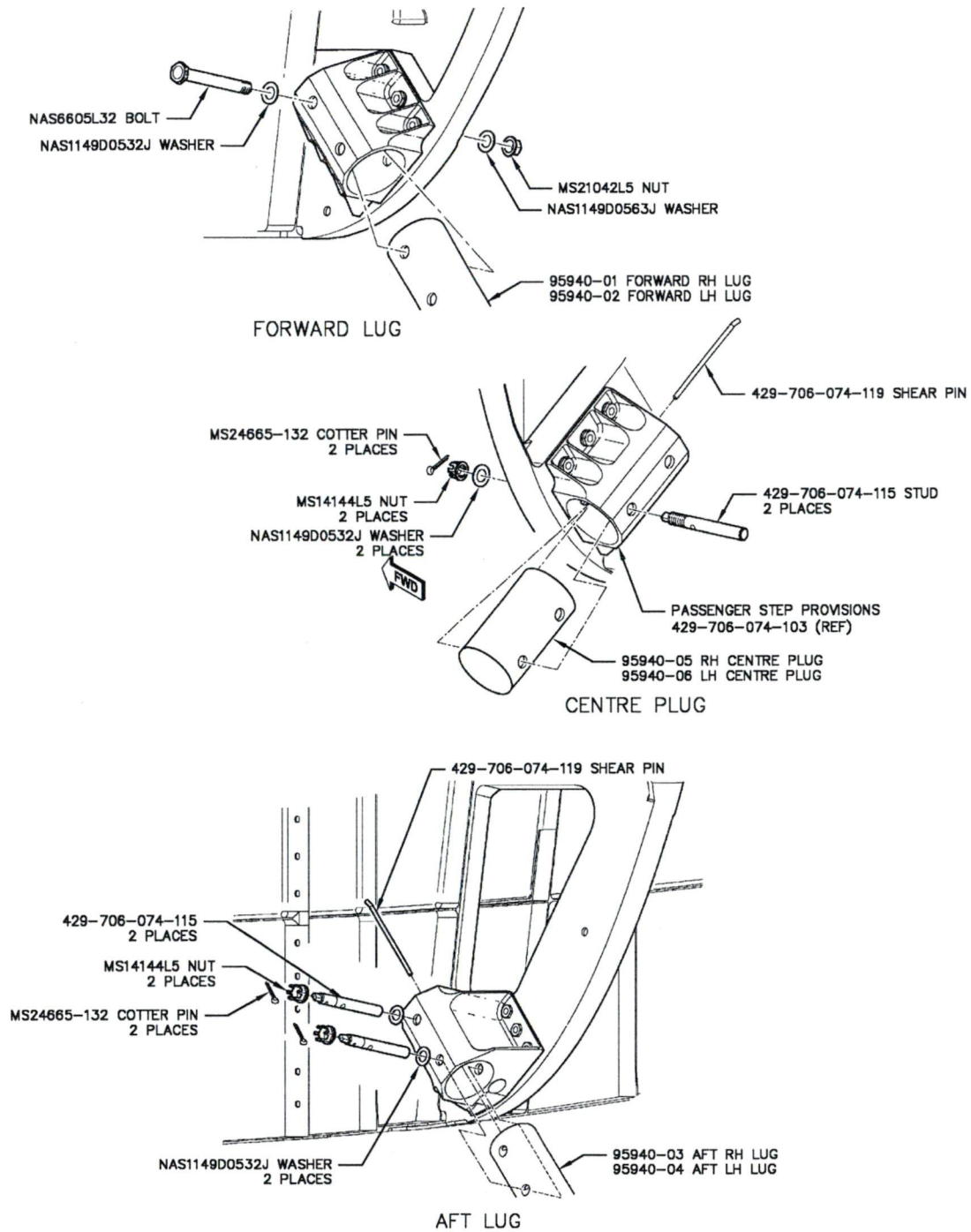


Figure 25.8 – Attachment Fittings Removal / Installation – S/N 57081 & sub.

5. Aft lugs: Remove two MS24665-132 Cotter Pins, MS141445L5 Nuts and NAS1149D0532J Washers from 429-706-074-115 Studs. Remove 429-706-074-119 Shear Pin. Remove studs from socket fittings. Remove 95940-03 (RH) and 95940-04 (LH) Aft Lugs from helicopter.

25-6 ATTACHMENT FITTINGS INSTALLATION

A) *Helicopter S/N 57001 through 57080. Refer to Figure 25.7.*

Materials Required: C-251 Sealant (ref: BHT-ALL-SPM)

1. Passenger Step Assembly must be removed prior to installation of the Attachment Fittings. Refer to Bell 429 Maintenance Manual, BHT-429-MM-1, section 32-57.
2. At the location of the forward and aft fittings, make sure the faying surfaces of the fitting assembly and fuselage skin are clean and prepared for bonding. Refer to BHT-ELEC-SPM, Chapter 8.
3. At four locations, apply sealant (C-251) to the faying surfaces of the fitting assembly and the fuselage skin.
4. Apply sealant (C-251) to the shanks of the bolts. Do not apply sealant to the bolt threads. Install while sealant is wet.
5. Install 95920-01 Forward Fitting on right hand forward step location on fuselage using NAS6603-13 Bolt (upper), NAS6603-10 Bolt (lower), NAS1149F0332P Washer (2), and MS21044N3 Nut. Repeat for left side.
6. Install 95921-01 Aft Right Fitting on right hand aft step location on fuselage and 95921-02 Aft Left Fitting on left hand aft step location on fuselage using:
 - a. Upper: NAS6603-15 Bolt, NAS1149F0363P Washer (2), MS21044N3 Nut
 - b. Lower: NAS6603-13 Bolt, NAS1149F0332P Washer (2), MS21044N3 Nut.
7. Torque nuts (8) to 20-25 inch-lbs (2.3-2.8 N-m).
8. At centre step support locations on fuselage, install two AN3-6A Bolt, NAS1149F0332P (2) Washer, and MS21044N3 Nut. Torque nuts to 12-15 inch-lbs (1.4-1.7 N-m).
9. Overcoat the fasteners with sealant (C-251).
10. Install the following access covers on both sides in accordance with Bell 429 Maintenance Manual, BHT-429-MM-1, Chapter 53:
 - a. Access Cover, station 184.0 (300AL and 300AR)
 - b. Access Cover, station 224.0 (300BL and 300BR)

B) *Helicopter S/N 57081 and subsequent. Refer to Figure 25.8.*

Materials Required: C-307 Sealant (ref: BHT-ALL-SPM)

1. Passenger Step Assembly must be removed prior to installation of the Attachment Fittings. Refer to Bell 429 Maintenance Manual, BHT-429-MM-1, section 32-57.

2. Install 95940-01 Forward RH Lug in right hand forward step socket in fuselage using two NAS6605L32 Bolt, NAS1149D0532J and NAS1149D0563J Washer, and MS21042L5 Nut. Repeat for left side using 95940-02 Forward LH Lug. Torque nuts (4) to 60-85 inch-lbs (6.8-9.6 N-m).
3. Insert 95940-05 RH Centre Plug in right hand centre step socket and 95940-06 LH Centre Plug in left hand centre step socket in fuselage. Insert two 429-706-074-115 Studs and retain with 429-706-074-119 Shear Pin in socket fitting. Install NAS1149D0532J Washer and MS14144L5 Nut on each stud. Torque nuts to 60-85 inch-lbs (6.8-9.6 N-m) and safety with MS24665-132 Cotter Pins.
4. Insert 95940-03 Aft RH Lug in right hand aft step socket in fuselage. Insert two 429-706-074-115 Studs and retain with 429-706-074-119 Shear Pin in socket fitting. Install NAS1149D0532J Washer and MS14144L5 Nut on each stud. Torque nuts to 60-85 inch-lbs (6.8-9.6 N-m) and safety with MS24665-132 Cotter Pins. Repeat for left side using 95940-04 Aft LH Lug.
5. Seal around lugs and plugs using 120-205-2 Seal, 6 places. Bond seal to fitting using C-307 adhesive.
6. Install the following access covers on both sides in accordance with Bell 429 Maintenance Manual, BHT-429-MM-1, Chapter 53:
 - c. Access Cover, station 184.0 (300AL and 300AR)
 - d. Access Cover, station 224.0 (300BL and 300BR)

25-7 ABRASION STRIP INSTALLATION

Abrasion strip is to be installed to protect forward cross tube from damage during installation and removal of the cargo basket.

1. Brush apply a thin coat of 3M-86A adhesion promoter on cross tube area to receive abrasion strip and allow to dry for 10 minutes.
2. Apply abrasion strip 427-015-001-131, or equivalent polyurethane protective strip (3M 8663) as applicable.

25-8 HANDLE BRACKET REPLACEMENT

Refer to Figure 25.9.

1. Remove two (2) AN3-11A Bolts, NAS1149F0363P Washers and MS21044N3 Nuts from each Handle Bracket. Remove handle brackets from basket hoops.
2. Slide replacement 84267-01 Handle Bracket onto basket hoops, 2 places. Align Handle Bracket to bushings in hoop. Insert two (2) AN3-11A Bolts with NAS1149F0363P Washers through Handle Bracket and bushing. Install NAS1149F0363P Washer and MS21044N3 Nut on each bolt. Torque nuts to 20-25 in-lbs (2.3-2.8 N-m).

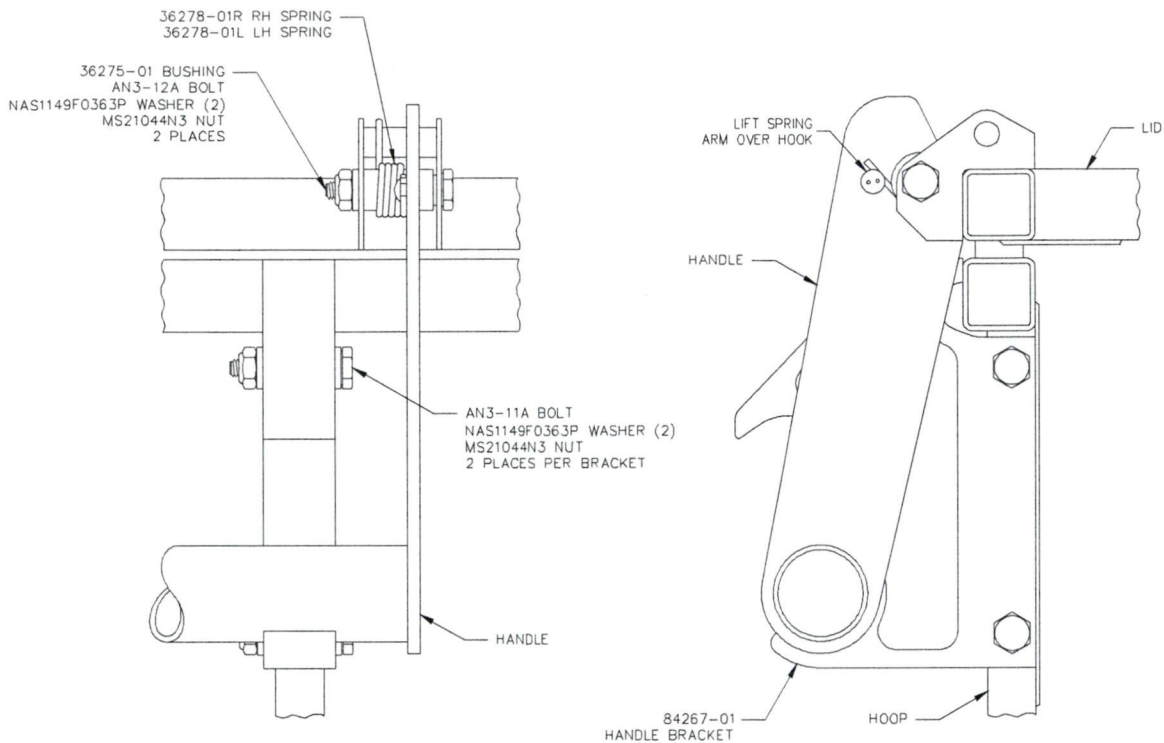


Figure 25.9 – Handle Bracket Parts

25-9 HANDLE SPRING REPLACEMENT

Refer to Figure 25.9.

1. Remove two (2) AN3-12A Bolts, NAS1149F0363P Washers (2) and MS21044N3 Nuts attaching handle to lid. Remove handle from basket. Remove springs from handle.
2. Slide replacement 36278-01R and 36278-01L Springs onto handle. Spring arm will catch on hook when on the correct side. Insert two 36275-01 bushings into handle attachments. Locate handle on basket, and insert two (2) AN3-12A Bolts with NAS1149F0363P Washers through bracket on lid and bushing in handle. Install NAS1149F0363P Washer and MS21044N3 Nut on each bolt. Torque nuts to 20-25 in-lbs (2.3-2.8 N-m). Lift spring arm over catch on handle and bar on lid bracket.

25-10 QUICK RELEASE PIN SPRING REPLACEMENT

1. Remove basket from mounting beams, refer to section 25-1.
2. At lower attachment keyway on aft beam, remove #10-32 stainless steel countersunk screw, 95931-10 Stop, and 69830-23 Spring. Discard defective spring.
3. Place 95931-10 Stop on #10-32 stainless steel countersunk screw. Slide replacement 69830-23 Spring onto Stop. Insert screw/Stop/Spring into guide in lower keyway of aft beam. Thread screw into barrel nut inside lever arm. Torque screw to 20-25 in-lbs (2.3-2.8 N-m).

25-11 LID PROP REPLACEMENT

1. Remove AN3-15A and AN3-17A Bolts, NAS1149F0363P Washers (3), AN970-3 Washers (2) and MS21044N3 Nuts attaching lid prop to basket assembly. Remove lid prop from basket
2. Locate replacement 36280-01 Lid Prop on bushings at forward end of basket and lid.
3. Insert AN970-3 Washer into lid end of prop, and slide AN3-15A Bolt with NAS1149F0363P Washer through bushing in lid. Install NAS1149F0363P Washer and MS21044N3 Nut on bolt.
4. Slide AN3-17A Bolt with AN970-3 Washer through bushing in basket. Install NAS1149F0363P Washer and MS21044N3 Nut on bolt.
5. Ensure lid prop is seated on bushings and torque nuts to 20-25 in-lbs (2.3-2.8 N-m).

25-12 BILL OF MATERIALS

1. 95902 Mounting Provisions – Helicopter S/N 57001 – 57080

Qty.	Part Number	Description
	95902-01-01	RH Mounting Provisions Installation
. 1	95930-01-01	RH Forward Beam Assembly
	95902-01-02	LH Mounting Provisions Installation
. 1	95930-01-02	LH Forward Beam Assembly
		(all continued)
. 1	95931-01-00	Aft Beam Assembly
. 2	95920-01	Forward Fitting
. 1	95921-01	Aft RH Fitting
. 1	95921-02	Aft LH Fitting
. 4	95922-01	Plate
. 4	95922-02	Plate
. 4	95923-01	Bushing
. 2	95923-02	Bushing
. 2	NAS6603-10	Bolt
. 4	NAS6603-13	Bolt
. 2	NAS6603-15	Bolt
. 8	AN3-15A	Bolt
. 4	AN3-6A	Bolt
. 36	NAS1149FO332P	Washer
. 4	NAS1149FO363P	Washer
. 20	MS21044N3	Nut
. 6	AN4-16A	Bolt
. 12	NAS1149FO463P	Washer
. 6	MS21044N4	Nut
A/R	C-251	Sealant

2. 95901 Quick Release Cargo Basket Installation – Helicopter S/N 57001 – 57080

Qty.	Part Number	Description
	95901-01-01	RH Cargo Basket Installation
. 1	95902-01-01	RH Basket Attachment Provisions Installation
. 1	95910-01-01	RH Cargo Basket Assembly
	95901-01-02	LH Cargo Basket Installation
. 1	95902-01-02	LH Basket Attachment Provisions Installation
. 1	95910-01-02	LH Cargo Assembly

3. 95907 External Attachment Provisions – Helicopter S/N 57081 & sub.

Qty.	Part Number	Description
	95907-01	External Attachment Provisions Installation
. 1	95940-01	Forward RH Lug
. 1	95940-02	Forward LH Lug
. 1	95940-03	Aft RH Lug
. 1	95940-04	Aft LH Lug
. 1	95940-05	Centre RH Plug
. 1	95940-06	Centre LH Plug
. 4	MS21042L5	Nut
. 4	NAS1149D0563J	Washer
. 12	NAS1149D0532J	Washer
. 4	NAS6605L32	Bolt
. 8	MS24665-132	Cotter Pin
. 8	MS14144L5	Nut
. 4	429-706-074-119	Shear Pin
. 8	429-706-074-115	Stud
. 6	120-205-2	Seal
A/R	C-307	Adhesive

4. 95906 Mounting Provisions – Helicopter S/N 57081 & sub.

Qty.	Part Number	Description
	95906-01-01	RH Basket Attachment Provisions Installation
. 1	95932-01-01	RH Forward Beam Assembly
	95906-01-02	LH Basket Attachment Provisions Installation
. 1	95932-01-02	LH Forward Beam Assembly
		(all continued)
. 1	95933-01-00	Aft Beam Assembly
. 4	95942-01	Plate
. 4	95942-02	Plate
. 4	95923-01	Bushing
. 2	95923-02	Bushing
. 8	AN3-15A	Bolt
. 16	NAS1149FO332P	Washer
. 8	MS21044N3	Nut
. 6	AN4-16A	Bolt
. 12	NAS1149FO463P	Washer
. 6	MS21044N4	Nut

4. 95905 Quick Release Cargo Basket Installation – Helicopter S/N 57081 & sub.

Qty.	Part Number	Description
	95905-01-01	RH Cargo Basket Installation
. 1	95906-01-01	RH Basket Attachment Provisions Installation
. 1	95950-01-01	RH Cargo Basket Assembly
	95905-01-02	LH Cargo Basket Installation
. 1	95906-01-02	LH Basket Attachment Provisions Installation
. 1	95950-01-02	LH Cargo Assembly

25-13 WEIGHT AND BALANCE

Multiple weight and balance configurations are required as the basket may be installed or removed in the field. The first is the mounting provisions only. The second is the configuration with the basket installed.

1. 95902 Mounting Provisions – Helicopter S/N 57001 - 57080

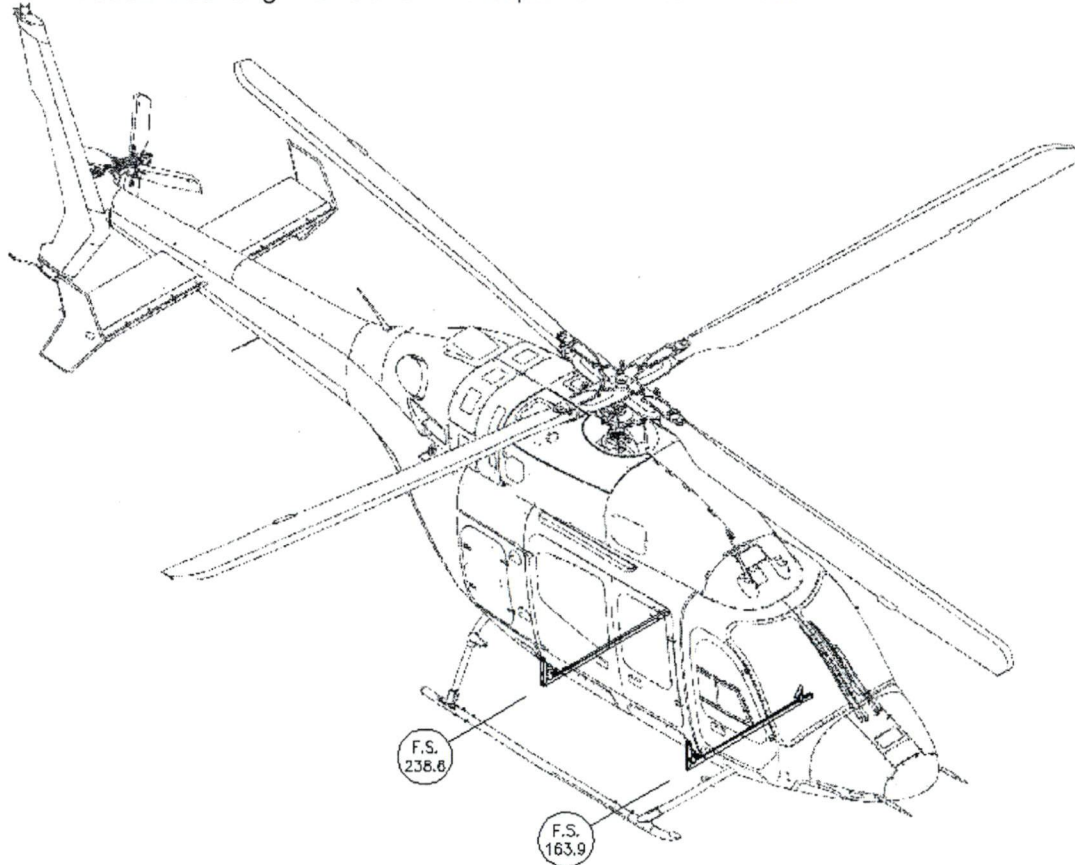


Figure 25.10 – Mounting Provisions Installation (95902 Configuration)

Part #	Standard Units Description	Weight (lbs)	Longitudinal		Lateral	
			Arm (in)	Moment (in-lbs)	Arm (in)	Moment (in-lbs)
95902-01-01	RH Mounting Provisions Installation (Total)	31.2	201.47	6286.01	2.91	90.85
95902-01-02	LH Mounting Provisions Installation (Total)	31.2	201.47	6286.01	-2.91	-90.85
429-030-080-107	LH Step Kit (removed)	-7.4	201.50	-1491.10	-33.40	247.16
429-030-080-108	RH Step Kit (removed)	-7.4	201.50	-1491.10	33.40	-247.16
Metric Units		(kg)	(mm)	(mm-kg)	(mm)	(mm-kg)
95902-01-01	RH Mounting Provisions Installation (Total)	14.15	5117.5	72423	74.0	1047
95902-01-02	LH Mounting Provisions Installation (Total)	14.15	5117.5	72423	-74.0	1047
429-030-080-107	LH Step Kit (removed)	-3.36	5118.1	-17180	-848.4	247
429-030-080-108	RH Step Kit (removed)	-3.36	5118.1	-17180	848.4	-247

2. 95901 Quick Release Cargo Basket Installation – Helicopter S/N 57001 – 57080

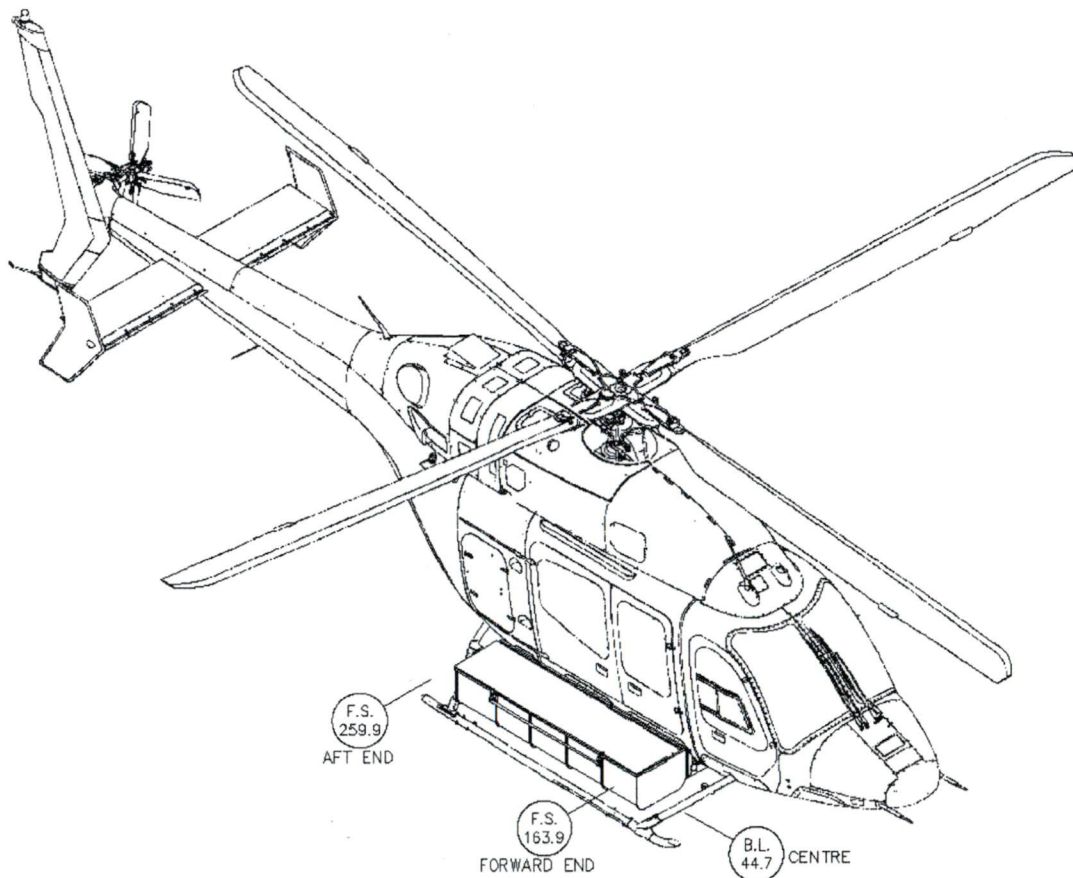


Figure 25.11 – Cargo Basket Installation (95901 Configuration)

Part #	Standard Units Description	Weight (lbs)	Longitudinal		Lateral	
			Arm (in)	Moment (in-lbs)	Arm (in)	Moment (in-lbs)
95910-01-01	RH Cargo Basket	71.2	211.86	15084.43	44.70	3182.64
95901-01-01	RH Quick Release Cargo Basket Installation (Total)	102.4	208.70	21370.44	31.97	3273.49
95910-01-02	LH Cargo Basket	71.2	211.86	15084.43	-44.70	-3182.64
95901-01-02	LH Quick Release Cargo Basket Installation (Total)	102.4	208.70	21370.44	-31.97	-3273.49
Metric Units		(kg)	(mm)	(mm-kg)	(mm)	(mm-kg)
95910-01-01	RH Cargo Basket	32.30	5381.2	173792	1135.4	36668
95901-01-01	RH Quick Release Cargo Basket Installation (Total)	46.45	5300.9	246214	812.0	37715
95910-01-02	LH Cargo Basket	32.30	5381.2	173792	-1135.4	-36668
95901-01-02	LH Quick Release Cargo Basket Installation (Total)	46.45	5300.9	246214	-812.0	-37715

3. 95906 Mounting Provisions and 95907 External Attachment Provisions –
Helicopter S/N 57081 & sub.

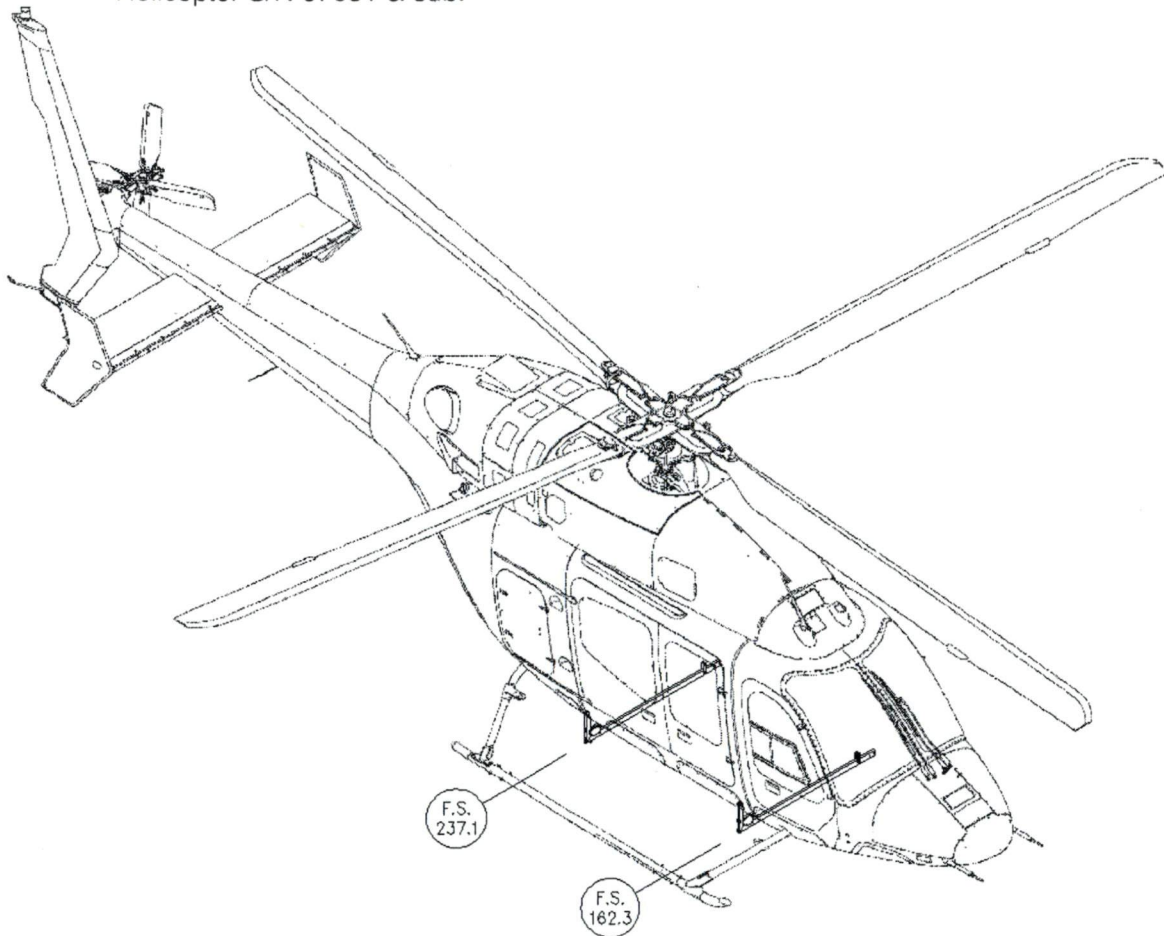


Figure 25.12 – Mounting Provisions Installation

Part #	Standard Units Description	Weight (lbs)	Longitudinal		Lateral	
			Arm (in)	Moment (in-lbs)	Arm (in)	Moment (in-lbs)
95906-01-01	RH Mounting Provisions Installation (Total)	32.5	200.33	6510.57	2.79	90.83
95906-01-02	LH Mounting Provisions Installation (Total)	32.5	200.33	6510.57	-2.79	-90.83
429-030-080-107	LH Step Kit (removed)	-5.5	201.40	-1107.70	-33.60	184.80
429-030-080-108	RH Step Kit (removed)	-5.5	201.40	-1107.70	33.60	-184.80
Metric Units			(mm)	(mm-kg)	(mm)	(mm-kg)
95906-01-01	RH Mounting Provisions Installation (Total)	14.74	5088.3	75010	71.0	1046
95906-01-02	LH Mounting Provisions Installation (Total)	14.74	5088.3	75010	-71.0	-1046
429-030-080-107	LH Step Kit (removed)	-2.49	5115.6	-12762	-853.4	2129
429-030-080-108	RH Step Kit (removed)	-2.49	5115.6	-12762	853.4	-2129

4. 95905 Quick Release Cargo Basket Installation – Helicopter S/N 57081 & sub.

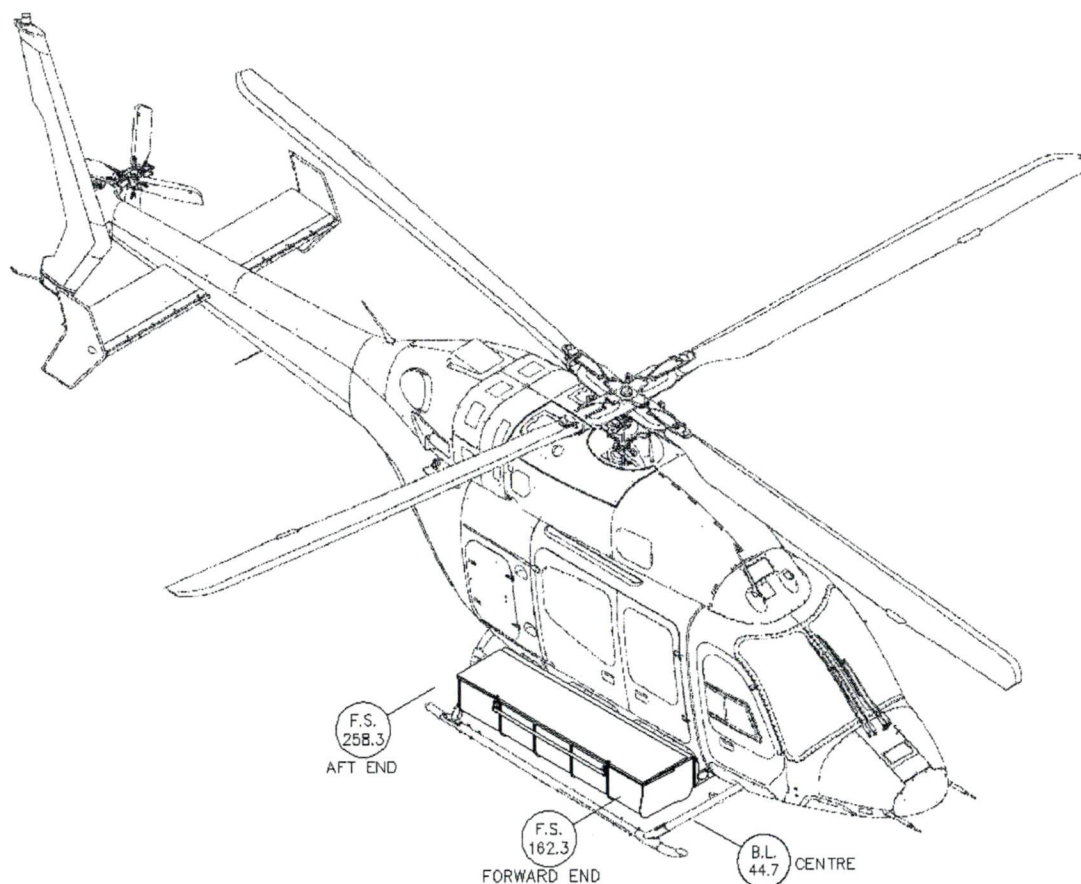


Figure 25.8 – Cargo Basket Installation

Part #	Standard Units Description	Weight (lbs)	Longitudinal		Lateral	
			Arm (in)	Moment (in-lbs)	Arm (in)	Moment (in-lbs)
95950-01-01	RH Cargo Basket	71.2	210.34	14976.21	44.70	3182.64
95905-01-01	RH Quick Release Cargo Basket Installation (Total)	103.7	207.20	21486.78	31.57	3273.47
95950-01-02	LH Cargo Basket	71.2	210.34	14976.21	-44.70	-3182.64
95905-01-02	LH Quick Release Cargo Basket Installation (Total)	103.7	207.20	21486.78	-31.57	-3273.47
Metric Units		(kg)	(mm)	(mm-kg)	(mm)	(mm-kg)
95950-01-01	RH Cargo Basket	32.30	5342.6	172545	1135.4	36668
95905-01-01	RH Quick Release Cargo Basket Installation (Total)	47.04	5262.9	247555	801.8	37714
95950-01-02	LH Cargo Basket	32.30	5342.6	172545	-1135.4	-36668
95905-01-02	LH Quick Release Cargo Basket Installation (Total)	47.04	5262.9	247555	-801.8	-37714

Cargo Basket Options – Standard Units

Part #	Description	Weight (lbs)	Longitudinal		Lateral	
			Arm (in)	Moment (in-lbs)	Arm (in)	Moment (in-lbs)
70408-01	Hangar Wheel (Aft End) (S/N 57001 – 57080)	0.8	257.50	206.00	+/-44.70	+/-35.76
70408-01	Hangar Wheel (Aft End) (S/N 57081 & Sub.)	0.8	256.00	204.80	+/-44.70	+/-35.76

Cargo Basket Options – Metric Units

Part #	Description	Weight (kg)	Longitudinal		Lateral	
			Arm (mm)	Moment (mm-kg)	Arm (mm)	Moment (mm-kg)
70408-01	Hangar Wheel (Aft End) (S/N 57001 – 57080)	0.36	6540.50	2354.58	+/- 1135.38	+/-412
70408-01	Hangar Wheel (Aft End) (S/N 57081 & Sub.)	0.36	6502.40	2359.55	+/- 1135.38	+/-412

25-14 STRUCTURAL FASTENER DATA

Refer to Bell Standard Practices Manual BHT-ALL-SPM for torque values not listed in this ICA.

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS ICA 969.91

BELL 429 CABIN STEPS

Preface

These Instructions for Continued Airworthiness shall be included in the rotorcraft Maintenance Manual when Cabin Steps are installed in accordance with the following Aero Design Ltd. Document Control List(s):

- DCL969-1, Revision 2 (Fixed Cabin Step Installation, Quick Release Cabin Step Installation)

The information contained herein supplements the information in the basic Maintenance Manual. For Maintenance practices and procedures not contained in these Instructions for Continued Airworthiness refer to the basic Maintenance Manual and its approved supplements.

Revision 1

Date: 08 May 2014

Aero Design Ltd.



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RECORD OF REVISIONS

Revision Number	Issue Date	Date Inserted	By
0	30 November 2012		Original Issue
1	08 May 2014		

LIST OF EFFECTIVE PAGES

List of Revisions	Revision 0 (Original Issue)	30 November 2012
	Revision 1	08 May 2014

List of Effective Pages

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NOTE

Revised text is indicated by a black vertical line. A revised page with only a vertical line next to the page number indicates that text has shifted or that non-technical correction(s) were made on that page. Insert latest revision pages; dispose of superseded pages.

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CHAPTER 0 – INTRODUCTION

0-1 SCOPE

The following Instructions for Continued Airworthiness (ICA) satisfy the requirements of CAR 527.1529, and provide the information necessary to complete the on-going maintenance and inspections required for rotorcraft embodying the Cabin Step Installations as described herein.

0-2 DEFINITIONS AND ABBREVIATIONS

ICA - Instructions for Continued Airworthiness

LH - Left Hand

RH - Right Hand

0-3 DISTRIBUTION

Copies of this ICA and amendments shall be distributed to all known purchasers of the Cabin Step Installation. Requests for a copy may be made in writing to:

Aero Design Ltd.
9888A Malaspina Road
Powell River, BC, Canada
V8A 0G3
Email: info@aerodesign.ca

Any changes will be sent to Transport Canada. All changes will be recorded in the Record of Revisions page at the front of this document.

0-4 COMPATIBILITY

Prior to incorporating this modification, the installer shall establish that the inter-relationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the helicopter.

The Quick Release Cabin Step is installed on the existing mounting provisions for the Cargo Basket Installation. The Quick Release step cannot be installed simultaneously with the Cargo Basket or vice versa.

0-5 GENERAL DESCRIPTION

Installation of the Cargo Basket mounting provisions requires removal of the existing Bell cabin step assemblies on both sides. This leaves the helicopter with no cabin access steps, which must be fitted with cabin steps in accordance with the basic configuration of the helicopter. The cabin step installations covered by these instructions use the cargo basket mounting provisions to provide for cabin access steps on both sides of the helicopter. The Fixed Cabin Step installation consists of a step assembly that is installed on the opposite side of the helicopter than the basket is installed on. The Quick Release Cabin Step installation is installed in place of the cargo basket when the basket is not in use, and uses the cargo basket locking mechanism to retain it in the mounting provisions.

The step itself consists of an aluminum extrusion welded to machined aluminum brackets. Strips of non-slip tape are adhered to the top of the step.

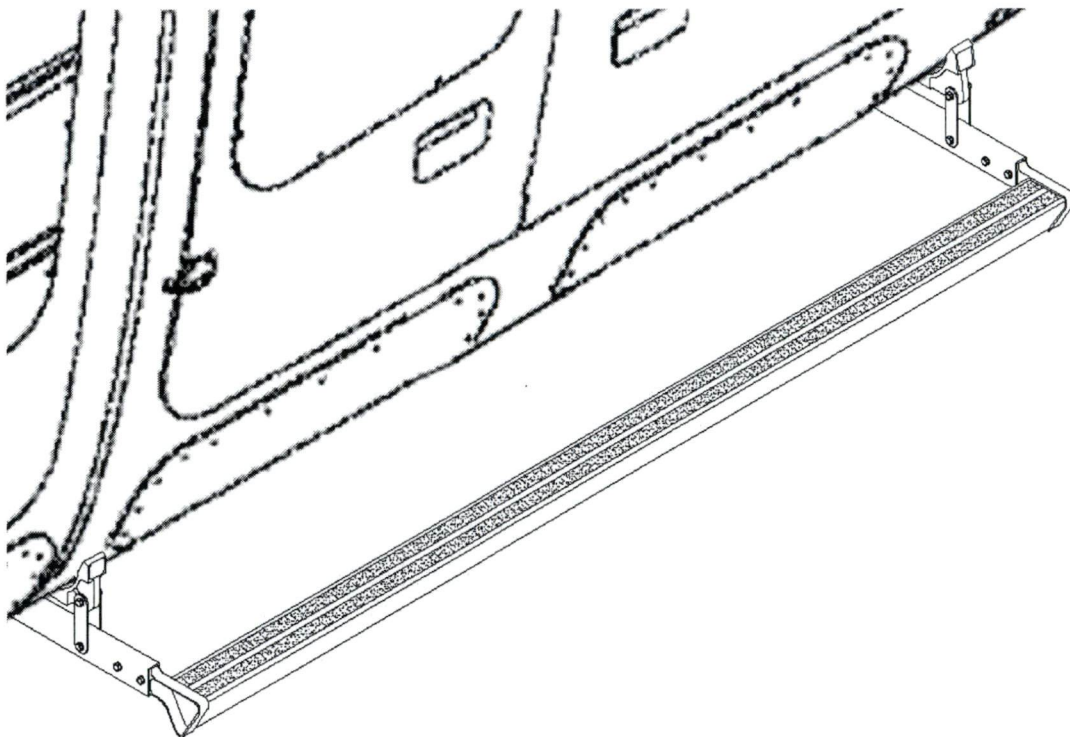


Figure 0-1 – Fixed Cabin Step

CHAPTER 4 - AIRWORTHINESS LIMITATIONS

Transport Canada

The Airworthiness Limitations section is approved by the Minister and specifies maintenance required by any applicable airworthiness or operating rule unless an alternative program has been approved by the Minister.

FAA

The Airworthiness Limitations section is FAA approved and specifies inspections and other maintenance required under Secs. 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

EASA

The Airworthiness Limitations section is approved and variations must also be approved.

No additional airworthiness limitations have been imposed due the installation of the Cabin Steps.

CHAPTER 5 – INSPECTION REQUIREMENTS

5-1 INSPECTION SCHEDULE

Continued airworthiness is contingent upon compliance with the following inspection items. These items shall be completed in conjunction with the rotorcraft Maintenance Inspection schedule, or other approved program, or upon removal and replacement of any component of the Cabin Step Installations. Refer to ICA959.91 for inspection requirements for the Cargo Basket Mounting Provisions.

Daily Inspection

1. Inspection Area: Step

- a) Inspect the step assembly for security and condition. Replace anti-slip tape if required, see Section 5-3.
- b) Quick Release Step only: Visually inspect the attachment fittings for condition and security. Ensure quick release mechanism is completely extended, flush with the outboard surface of the beam. If pin does not completely extend, or spring tension is not sufficient to retain step, replace spring, refer to ICA959.91, section 25-10.

200 Hour or Annual Inspection

1. Inspection Area: Step

- a) Perform daily inspection.
- b) Visually inspect all mounting hardware for condition and security.
- c) Visually inspect step and mounting brackets for corrosion, cracks or other damage. Repair damage found in accordance with section 5-2.

Special Inspections

1. Following a hard landing inspect the Fixed Cabin Step installation in accordance with the 200 hour or annual inspection listed above.

5-2 DAMAGE LIMITS / REPAIR INSTRUCTIONS

If damage is found in the inspections above, repair in accordance with the instructions below.

1. Step Assembly – Fixed and Quick Release

Part	Type of Damage	Max. Allowable	Repair
Brackets	Corrosion	0.010" deep (0.25 mm deep)	Blend up to 0.010" (0.25 mm) deep with scotchbrite.
	Scratches / Nicks	0.010" deep x 0.5" long (0.25 mm deep x 13 mm long)	Blend up to 0.010" (0.25 mm) deep with scotchbrite.
	Cracks/Dents Bent Lugs	None None	N/A N/A
Step Section	Corrosion	2" x 2" x 0.010" deep (51 mm x 51 mm x 0.25 mm deep)	Blend up to 0.010" (0.25 mm) deep with scotchbrite.
	Scratches / Nicks	0.010" deep x 1" long (0.25 mm deep x 25 mm long)	Blend up to 0.010" (0.25 mm) deep with scotchbrite.
	Cracks / Dents Permanent Deflection of Step	None 0.25" (6 mm) max at middle of step	N/A None
Welds	Cracks	0.25" (6 mm) max	See 2. below

2. Weld repair

Cracks up to 0.25" (6mm) in length may be repaired as follows:

- Clean area of paint or powder coat (as applicable).
- Grind away weld in area of crack.
- TIG weld in accordance with AMS2685C or equivalent, using ER4043 filler rod. Do not grind flush.
- Touch up paint in accordance with section 5-3

5-3 PROTECTIVE TREATMENT INFORMATION

1. Step Assembly

The Step Assembly is supplied powder coated. If the powder coat is damaged, touch up in accordance with Bell Standard Procedures Manual, BHT-SPM-ALL, Chapter 4 and Chapter 5.

The tread areas have two strips of 3M Safety-Walk grip tape, 1 inch (25 mm) wide. If the grip tape is damaged replace with equivalent grip tape, or apply MIL-W-5044, Type 2, anti-slip paint to the top surface.

CHAPTER 32 – LANDING GEAR

The Cabin Step installations may be applied to the right or left side of the helicopter, depending on the Mounting Provisions that are installed.

The Cargo Basket Mounting Provisions differ for helicopters S/N 57001 through 57080 and 57081 and subsequent. The instructions provided are applicable all S/N.

32-1 FIXED CABIN STEP REMOVAL

Configuration: 96901-01-01 (right), 96901-01-02 (left) (S/N 57001 – 57080)
96905-01-01 (right), 96905-01-02 (left) (S/N 57081 & sub.)

Refer to Figure 0-1 and 32-1.

1. Remove two (2) AN4-14A bolts, NAS1149F0463P washers, MS21044N4 nuts securing step bracket into forward and aft mounting beams. Slide Step Assembly 96910-01 out of mounting beams.

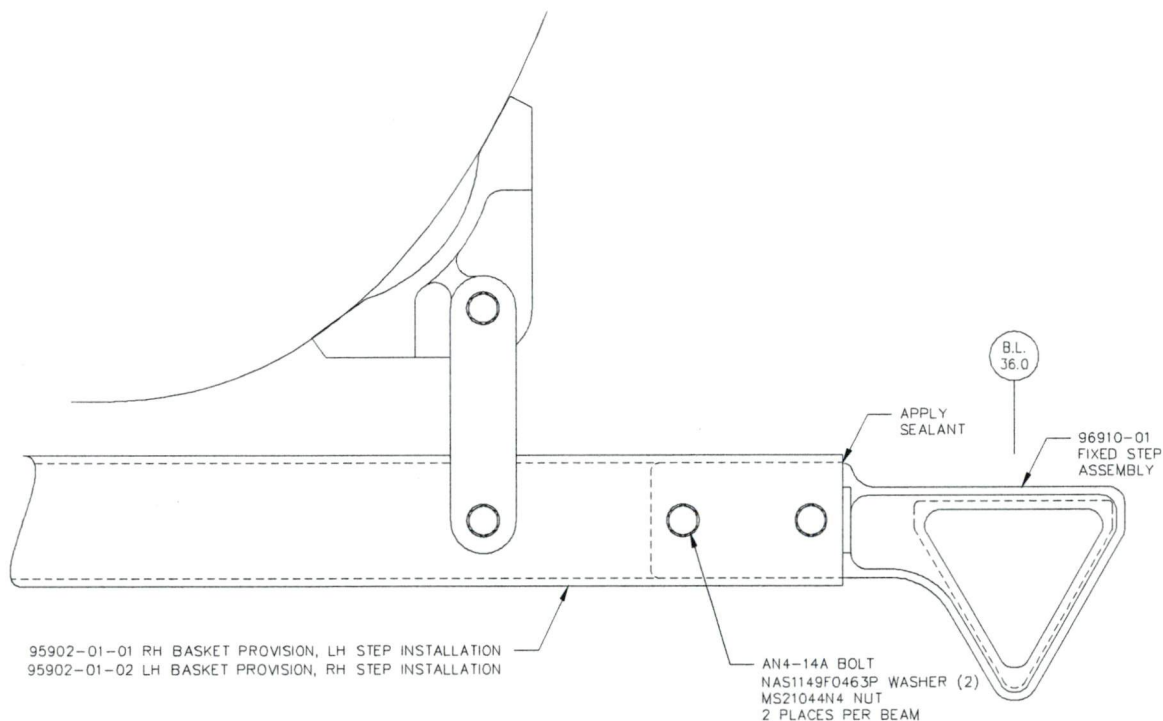


Figure 32-1 – Fixed Step Installation
(96901-01-02 shown, all others similar)

32-2 FIXED CABIN STEP INSTALLATION

Configuration: 96901-01-01 (right), 96901-01-02 (left) (S/N 57001 – 57080)
96905-01-01 (right), 96905-01-02 (left) (S/N 57081 & sub.)

Refer to figure 0-1 and 32-1.

1. Cargo Basket Attachment Provisions must be installed prior to installation of step. Refer to ICA959.91, section 25.
 - a. 95902-01-01 right side basket (S/N 57001 – 57080)
 - b. 95902-01-02 left side basket (S/N 57001 – 57080)
 - c. 95906-01-01 right side basket (S/N 57081 & sub.)
 - d. 95906-01-02 left side basket (S/N 57081 & sub.)
2. Clean inside of forward and aft mounting beam as required to remove any residual sealant or powder coat. A file or 80 grit emery paper may be used.
3. Apply sealant (C-251) to the faying surfaces of the mounting beam and Step Assembly 96910-01.
4. Insert brackets on Step Assembly 96910-01 into ends of forward and aft mounting beams. Slide until against stop on step bracket.
5. Insert two (2) AN4-14A Bolts, NAS1149F0463P Washers (2), and MS21044N4 Nuts into holes in forward mounting beam, through step bracket. Repeat for aft mounting beam.
6. Torque AN4 Bolts to 30-40 in-lbs (4-5 N-m).
7. Apply bead of sealant (C-251) at interface of step bracket and mounting beam.

32-3 QUICK RELEASE CABIN STEP REMOVAL

Configuration: 96902-01-01 (right), 96902-01-02 (left) (S/N 57001 – 57080)
96906-01-01 (right), 96906-01-02 (left) (S/N 57081 & sub.)

Refer to Figure 32-2 and 32-3.

1. Pull lever at bottom end of aft beam inboard to retract retaining pin and lift step until lower attachment fitting is free of keyway. Keep upper attachment in slot in beam.
2. Lift step until upper attachment is out of keyway on aft beam. Slide step forward and rotate aft end outboard until forward attachments are free from keyways in forward beam.

32-4 QUICK RELEASE CABIN STEP INSTALLATION

Configuration: 96902-01-01 (right), 96902-01-02 (left) (S/N 57001 – 57080)
96906-01-01 (right), 96906-01-02 (left) (S/N 57081 & sub.)

Refer to Figure 32-2 and 32-3.

1. Slide forward attachments of Quick Release Step Assembly 96911-01 into forward mounting beam.

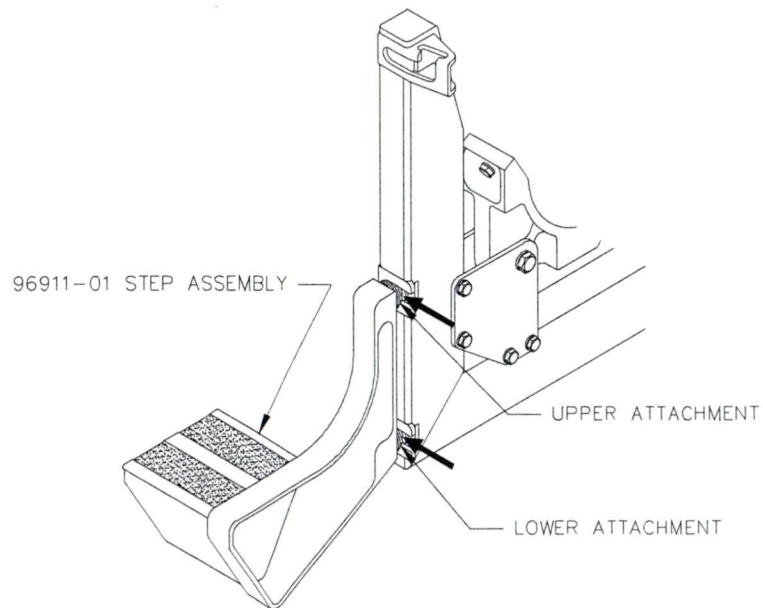


Figure 32-2 – Quick Release Step Forward Attachment

2. At aft end, rotate step inboard and pull step aft to aft mounting beam. Align attachment fittings on step with keyways, push step in and down to engage attachments into keyways on aft beam. Pin at lower attachment will spring into place with a snap.

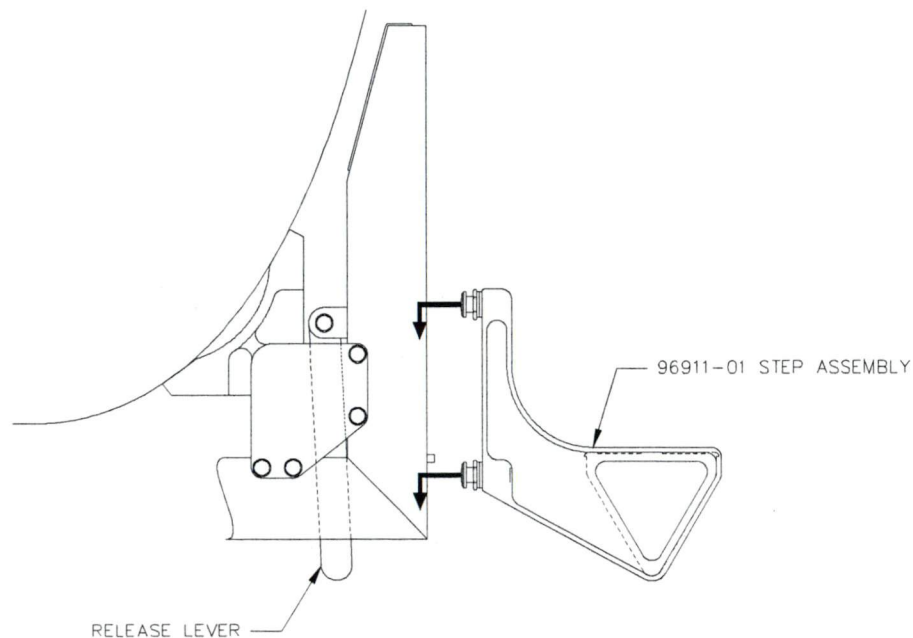


Figure 32-3 – Quick Release Step Aft Attachment

3. Check that step is secure by pulling up on aft end.

32-5 BILL OF MATERIALS

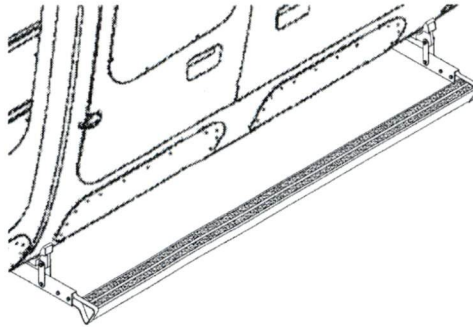


Figure 32-4 – Fixed Cabin Step Installation (Left shown)

FIXED CABIN STEP INSTALLATION

Qty.	Part Number	Description
	96901-01-01	RH Fixed Cabin Step Installation (S/N 57001 – 57080)
. 1	95902-01-02	LH Basket Attachment Provisions Installation
	96901-01-02	LH Fixed Cabin Step Installation (S/N 57001 – 57080)
. 1	95902-01-01	RH Basket Attachment Provisions Installation
	96905-01-01	RH Fixed Cabin Step Installation (S/N 57081 & sub.)
. 1	95906-01-02	LH Basket Attachment Provisions Installation
	96905-01-02	LH Fixed Cabin Step Installation (S/N 57081 & sub.)
. 1	95906-01-01	RH Basket Attachment Provisions Installation
		(all continued)
. 1	96910-01	Fixed Step Assembly
. 4	AN4-14A	Bolt
. 8	NAS1149F0463P	Washer
. 4	MS21044N4	Nut

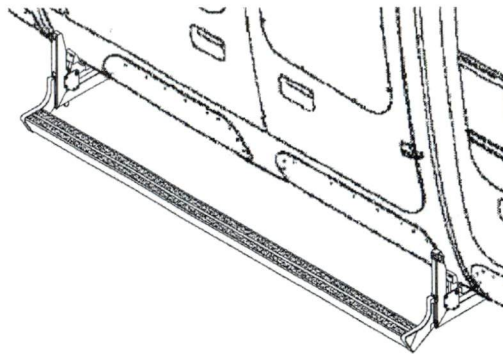


Figure 32-5 – Quick Release Step Installation (Right shown)

QUICK RELEASE CABIN STEP INSTALLATION

Qty.	Part Number	Description
	96902-01-01	RH Quick Release Cabin Step Installation (S/N 57001 – 57080)
. 1	95902-01-01	RH Basket Attachment Provisions Installation
	96902-01-02	LH Quick Release Cabin Step Installation (S/N 57001 – 57080)
. 1	95902-01-02	LH Basket Attachment Provisions Installation
	96906-01-01	RH Quick Release Cabin Step Installation (S/N 57081 & sub.)
. 1	95906-01-01	RH Basket Attachment Provisions Installation
	96906-01-02	LH Quick Release Cabin Step Installation (S/N 57081 & sub.)
. 1	95906-01-02	LH Basket Attachment Provisions Installation
		(all continued)
. 1	96911-01	Quick Release Step Assembly

32-6 WEIGHT AND BALANCE**Standard**

P/N	Description	Weight	Longitudinal		Lateral	
		lb	arm in	moment in-lb	arm in	moment in-lb
Fixed Step (S/N 57001 – 57080)						
95902-01-02	LH Attachment Provisions Installation	31.2	201.47	6286.01	-2.91	-90.85
96910-01	Fixed Cabin Step Assembly	5.8	201.25	1167.25	35.70	207.06
96901-01-01	RH Fixed Cabin Step Installation (total)	37.0	201.44	7453.26	3.14	116.21
95902-01-01	RH Attachment Provisions Installation	31.2	201.47	6286.01	2.91	90.85
96910-01	Fixed Cabin Step Assembly	5.8	201.25	1167.25	-35.70	-207.06
96901-01-02	LH Fixed Cabin Step Installation (total)	37.0	201.44	7453.26	-3.14	-116.21
Fixed Step (S/N 57081 & sub.)						
95906-01-02	LH Attachment Provisions Installation	32.5	200.33	6510.57	2.79	90.83
96910-01	Fixed Cabin Step Assembly	5.8	199.75	1158.55	35.70	207.06
96905-01-01	RH Fixed Cabin Step Installation (total)	38.3	200.24	7669.12	3.03	116.23
95906-01-01	RH Attachment Provisions Installation	32.5	200.33	6510.57	2.79	90.83
96910-01	Fixed Cabin Step Assembly	5.8	199.75	1158.55	-35.70	-207.06
96905-01-02	LH Fixed Cabin Step Installation (total)	38.3	200.24	7669.12	-3.03	-116.23
Quick Release Step (S/N 57001 – 57080)						
95902-01-01	RH Attachment Provisions Installation	31.2	201.47	6286.01	2.91	90.85
96911-01	Quick Release Cabin Step Assembly	6.0	201.25	1207.50	35.76	214.56
96902-01-01	RH Quick Release Cabin Step Installation (total)	37.2	201.44	7493.51	8.21	305.41
95902-01-02	LH Attachment Provisions Installation	31.2	201.47	6286.01	-2.91	-90.85
96911-01	Quick Release Cabin Step Assembly	6.0	201.25	1207.50	-35.76	-214.56
96902-01-02	LH Quick Release Cabin Step Installation (total)	37.2	201.44	7493.51	-8.21	-305.41
Quick Release Step (S/N 57081 & sub.)						
95902-01-01	RH Attachment Provisions Installation	32.5	200.33	6510.57	2.79	90.83
96911-01	Quick Release Cabin Step Assembly	6.0	199.75	1198.50	35.76	214.56
96902-01-01	RH Quick Release Cabin Step Installation (total)	38.5	200.24	7709.07	7.93	305.39
95902-01-02	LH Attachment Provisions Installation	32.5	200.33	6510.57	-2.79	-90.83
96911-01	Quick Release Cabin Step Assembly	6.0	199.75	1198.50	-35.76	-214.56
96902-01-02	LH Quick Release Cabin Step Installation (total)	38.5	200.24	7709.07	-7.93	-305.39

Metric						
P/N	Description	Weight	Longitudinal		Lateral	
		kg	arm mm	moment mm-kg	arm mm	moment mm-kg
Fixed Step (S/N 57001 – 57080)						
95902-01-02	LH Attachment Provisions Installation	14.15	5117.46	72422.75	-73.96	-1046.73
96910-01	Fixed Cabin Step Assembly	2.63	5111.75	13448.19	906.78	2385.59
96901-01-01	RH Fixed Cabin Step Installation (total)	16.78	5116.56	85870.95	79.78	1338.86
95902-01-01	RH Attachment Provisions Installation	14.15	5117.46	72422.75	73.96	1046.73
96910-01	Fixed Cabin Step Assembly	2.63	5111.75	13448.19	-906.78	-2385.59
96901-01-02	LH Fixed Cabin Step Installation (total)	16.78	5116.56	85870.95	-79.78	-1338.86
Fixed Step (S/N 57081 & sub.)						
95906-01-02	LH Attachment Provisions Installation	14.74	5088.26	75009.97	-70.99	-1046.48
96910-01	Fixed Cabin Step Assembly	2.63	5073.65	13347.96	906.78	2385.59
96905-01-01	RH Fixed Cabin Step Installation (total)	17.37	5086.05	88357.92	77.08	1339.12
95906-01-01	RH Attachment Provisions Installation	14.74	5088.26	75009.97	70.99	1046.48
96910-01	Fixed Cabin Step Assembly	2.63	5073.65	13347.96	-906.78	-2385.59
96905-01-02	LH Fixed Cabin Step Installation (total)	17.37	5086.05	88357.92	-77.08	-1339.12
Quick Release Step (S/N 57001 – 57080)						
95902-01-01	RH Attachment Provisions Installation	14.15	5117.46	72422.75	73.96	1046.73
96911-01	Quick Release Cabin Step Assembly	2.72	5111.75	13911.92	908.30	2472.00
96902-01-01	RH Quick Release Cabin Step Installation (total)	16.87	5116.54	86334.68	208.53	3518.73
95902-01-02	LH Attachment Provisions Installation	14.15	5117.46	72422.75	-73.96	-1046.73
96911-01	Quick Release Cabin Step Assembly	2.72	5111.75	13911.92	-908.30	-2472.00
96902-01-02	LH Quick Release Cabin Step Installation (total)	16.87	5116.54	86334.68	-208.53	-3518.73
Quick Release Step (S/N 57081 & sub.)						
95906-01-01	RH Attachment Provisions Installation	14.74	5088.26	75009.97	70.99	1046.48
96911-01	Quick Release Cabin Step Assembly	2.72	5073.65	13808.23	908.30	2472.00
96906-01-01	RH Quick Release Cabin Step Installation (total)	17.46	5085.98	88818.20	201.48	3518.48
95906-01-02	LH Attachment Provisions Installation	14.74	5088.26	75009.97	-70.99	-1046.48
96911-01	Quick Release Cabin Step Assembly	2.72	5073.65	13808.23	-908.30	-2472.00
96906-01-02	LH Quick Release Cabin Step Installation (total)	17.46	5085.98	88818.20	-201.48	-3518.48

32-7 STRUCTURAL FASTENER DATA

Refer to Standard Practices Manual, BHT-ALL-SPM, for torque values not listed in this ICA.

CERTIFICATION PLAN

CP959.10

BELL 429

EXTERNAL CARGO BASKET MODIFICATION TO SUIT S/N 57081 & SUB.

Prepared by: Jeff Clarke, P.Tech.(Eng.)

Revision 2, 27 August 2014

Aero Design Ltd.



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1.0 INTRODUCTION

This certification plan details the means and methods of compliance for the Airworthiness Requirements shown on Compliance Program CP959-1, Rev. 1 (Appendix A)

2.0 BASIS OF CERTIFICATION

TCDS H-107, Issue 3:

Airworthiness Manual (AWM) Chapter 527 – *Normal Category Rotorcraft* at Change 527-9 published December 1, 2009 (equivalent to FAR part 27 at Amdt. 27-44), including Appendix B for IFR and Appendix C for Category A, plus

FAR Part 27, Amdt. 27-44, effective June 16, 2008 as adopted by reference

AWM Chapter 527 Appendix C – *Criteria for Category A* specifies certain sections of AWM Chapter 529 – *Transport Category Rotorcraft*. For these specified sections, AWM Chapter 529 at Change 529-6 published June 30, 2008 (equivalent to FAR Part 29 at Amdt. 29-45) is applicable, plus FAR 29.1587(a)(7) Amdt. 29-51, effective March 31, 2008 as adopted by reference.

3.0 APPLICABILITY OF AIRWORTHINESS DIRECTIVES

Airworthiness Directives applicable to the Bell 429 were reviewed, and none were found to affect this project.

4.0 PERSONNEL

Applicant: Aero Design Ltd. – Jeff Clarke, P.Tech.(Eng.)

Delegate: James Tinson, DAR 304

Transport Canada: Jack Staal, PNR Region

5.0 CAR 527 SUBPART B - FLIGHT

5.1 527.29 – Empty Weight and Corresponding C of G

5.1.1 Means of Compliance

- a) Review, calculate and inspect

5.1.2 Method of Compliance

Weight and balance information required to compute the aircraft empty weight and corresponding C of G with the cargo basket, cabin steps and mounting provisions installed is provided on each installation drawing as well as in the Instructions for Continued Airworthiness.

5.1.3 Compliance Documents, Data and Testing

- a) Installation drawings: 95901, 95902, 95905, 95906, 95907, 96901, 96902
- b) Instructions for Continued Airworthiness: ICA959.91 and ICA969.91

5.1.4 Schedule

Drawings and ICA to be submitted for Transport Canada review by ~~15 April 2014~~

5.1.5 Level of Delegation

Finding of compliance to CAR 527.29 delegated.

5.1.6 Level of Involvement

Review of installation drawings and ICAs.

5.2 527.51, .65, .67, .71, .75, .141, .143, .171, .173, .175, .177, .231, 241, .251, .547**5.2.1 Means of Compliance**

a) Flight Test

5.2.2 Method of Compliance

a) Flight testing performed by Transport Canada flight test pilot Michel Brulotte and Bell Helicopters to determine Vne, performance information, acceptable controllability and stability over the flight envelope.

5.2.3 Compliance Documents, Data and Testing

Flight Test Report – prepared by Michel Brulotte, Transport Canada Flight Test Pilot

5.2.4 Schedule

N/A – Previous flight testing and report main applicable.

5.2.5 Level of Delegation

None – no change from original issue of STC

5.2.6 Level of Involvement

None – no change from original issue of STC

6.0 CAR 527 SUBPART C – STRENGTH REQUIREMENTS**6.1 527.301, .303, .305, .307, .337, .625****6.1.1 Means of Compliance**

- a) Analysis
- b) Load Test

6.1.2 Method of Compliance

- a) Using CAR 527.301, 527.303, 527.337, 527.625, develop the loads to be applied to the cargo basket installation.

- b) Perform analysis to demonstrate that the cargo basket, mounting beams, and attachments to the fuselage are capable of supporting the loads without deformation at limit load and without failure at ultimate load.
- c) For those parts where analysis may not be reasonably feasible, or where the standards require it, load test the parts/assemblies to demonstrate they are capable of supporting the loads without deformation at limit load and without failure at ultimate load.

6.1.3 Compliance Documents, Data and Testing

Engineering Report ER959.03

Test Plan and Report TR959.04

Test Plan and Report TR959.05

6.1.4 Schedule

Engineering Report ER959.03 – due ~~15 April 2014~~

Test Plan and Report TR959.04 and TR959.05 – submit for TC review by ~~21 March 2014~~, test by ~~28 March 2014~~, TC review of results by ~~15 April 2014~~

6.1.5 Level of Delegation

Finding of compliance to 527.305 and 527.307 delegated.

6.1.6 Level of Involvement

Deliverable	Transport Canada Level of Involvement
TR959.04	Requires Transport Canada review and acceptance before test
TR959.05	Requires Transport Canada review and acceptance before test
Load Tests	Delegate to witness
TR959.04	Requires Transport Canada review and acceptance of results before Finding of Compliance
TR959.05	Requires Transport Canada review and acceptance of results before Finding of Compliance

7.0 CAR 527 SUBPART D – DESIGN AND CONSTRUCTION

7.1 527.601, .603, .605, .609, .611, .613

7.1.1 Means of Compliance

- a) Review of applicable MIL, ASTM and other process specifications.

7.1.2 Method of Compliance

- a) Material specifications (MIL-, ASTM, etc.) on drawings. Material strength properties from specifications used in analysis.

- b) Process specification for lay-up of carbon fiber parts to be created and specified on drawings.

7.1.3 Compliance Documents, Data and Testing

Fabrication drawings – see Document Control List DCL959-11, DCL959-12, DCL959-15, DCL959-16

7.1.4 Schedule

Process specification for carbon fibre lay-up – submit to TC for review by 28 March 2014

7.1.5 Level of Delegation

Finding of compliance to 527.603, 527.605(a), 527.613 delegated.

7.1.6 Level of Involvement

None

Deliverable	Transport Canada Level of Involvement
Process Specification	Requires Transport Canada review and acceptance

7.2 527.727 – Reserve Energy Absorption Drop Test

7.2.1 Means of Compliance

- a) Test

7.2.2 Method of Compliance

- a) Minimum ground clearance to comply with Reserve Energy Absorption Drop Test has been provided by Bell Helicopters (see ER959.01, Appendix A), basket installation does not exceed this minimum clearance.

7.2.3 Compliance Documents, Data and Testing

Engineering Report ER959.01

7.2.4 Schedule

None

7.2.5 Level of Delegation

None – no change from original issue of STC

7.2.6 Level of Involvement

None – no change from original issue of STC

8.0 CAR 527 SUBPART G – OPERATING LIMITATIONS AND INFORMATION

8.1 527.1505, .1525, .1581, .1583, .1585, .1587, .1589

8.1.1 Means of Compliance

a) Test

8.1.2 Method of Compliance

a) TCCA Flight Test

8.1.3 Compliance Documents, Data and Testing

Flight Test Report – prepared by Michel Brulotte – contains performance information
Flight Manual Supplement FMS959.90, FMS969.90

8.1.4 Schedule

FMS959.90, FMS969.90 – submit to TC for review and approval by ~~15 April 2014~~

8.1.5 Level of Delegation

None

8.1.6 Level of Involvement

Deliverable	Transport Canada Level of Involvement
FMS959.90	Requires Transport Canada review and approval
FMS959.91	Requires Transport Canada review and approval

8.2 527.1529

8.2.1 Means of Compliance

a) Instructions for Continued Airworthiness provided

8.2.2 Method of Compliance

a) Instructions for Continued Airworthiness are prepared in accordance with CAR 527 Appendix A

8.2.3 Compliance Documents, Data and Testing

Instructions for Continued Airworthiness ICA959.91 to Revision 1

Changes from TCCA accepted revision 0:

1. Cover: Contact information updated, DCL revision
2. Section 0-3: Contact information updated
3. Section 0-4: Add compatibility note regarding wheeled landing gear
4. Section 5-1: Add inspection and reference for instructions for lid prop.

5. Section 5-2: Add damage limits and additional repair instructions.
6. Section 5-3: Remove colour references (all were white). Add reference to Bell standard procedures manual for paint touch up.
7. Section 11: Add updated placards
8. Section 25: Add installation and removal instructions, bill of materials and weight and balance for new configuration; add replacement instructions for lid prop; add metric torques.

Instructions for Continued Airworthiness ICA969.91 to revision 1

Changes from TCCA accepted revision 0:

1. Cover: Contact information updated, DCL revision
2. Section 0-3: Contact information updated
3. Section 0-5: Clarified description
4. Section 5-3: Remove colour references (all were white).
5. Section 32: Add references to applicable serial number ranges, remove alternate configuration.
6. Section 32-6: Corrected P/N in weight and balance

8.2.4 Schedule

ICA959.91, ICA969.91 – submit to TC for review and acceptance by ~~15 April 2014~~

8.2.5 Level of Delegation

None

8.2.6 Level of Involvement

Deliverable	Transport Canada Level of Involvement
ICA959.91	Requires Transport Canada review and acceptance
ICA969.91	Requires Transport Canada review and acceptance

9.0 EFFECT OF MINOR CHANGES ON EXISTING FINDINGS OF COMPLIANCE

Minor changes to the existing approved drawings are also incorporated at this issue. Evaluation of the changes is addressed below. There are no changes to the design data that invalidate the existing findings of compliance.

All original approved documents - excluding engineering reports, load test reports, flight test reports or similar documents - are revised to incorporate the new company contact information and logo, which does not affect any finding of compliance. Changes beyond the address and logo are addressed below. A list of all changed documents is in Appendix B.

9.1 General

The following changes are made on a number of drawings as indicated on the drawing.

Change: Hardware part numbers updated to current (e.g. AN960 Washer part numbers updated to NAS1149).

Reason: Update to current part numbers.

Effect: None.

9.2 Document Control List DCL959-1 to Revision 2 – Cargo Basket Installation

9.2.1 Drawing 95901 to Revision 1 – Basket Installation

Change: Lid brace hardware removed, changed to reference lid brace installation drawing.

Reason: Same lid brace installation used for all baskets.

Effect: None.

9.3 Document Control List DCL959-2 to Revision 2 – Mounting Provisions Installation

9.3.1 Drawing 95902 to Revision 1 – Mounting Provisions Installation

Change: Metric torque spec added.

Reason: Torque specs were missing metric units.

Effect: None.

9.4 Document Control List DCL959-11 to Revision 1 – Cargo Basket Fabrication

9.4.1 Drawing 95910 to Revision 1 – Basket Assembly

Change: Alternate sealing compound added.

Reason: Sealant is used primarily to reduce rattles between flat sheets and tube structure, not to seal out moisture. New sealant provides adhesion in addition to preventing rattles.

Effect: Improved joint strength over original configuration.

Change: Alternate filler sheet added (item 13).

Reason: See 95916 to Rev. 1

Effect: None.

Change: HuckMax rivets added as alternative to CherryMax rivets.

Reason: HuckMax rivets provide better forming of the rivet tail.

Effect: None. Both fasteners meet the requirements of NAS9301.

9.4.2 Drawing 95911 to Revision 1 – Basket Fabrication

Change: # of welds down sides increased from first 4 intersections to first 5 intersections.

Reason: Standardization with other baskets.

Effect: Better load transfer from mesh into frame over approved configuration.

Change: Stainless steel welding rod added to welding notes.

Reason: Lid prop lug material changed to stainless steel - see drawing 49215, Rev. 1.

Effect: None.

9.4.3 Drawing 95912 to Revision 1 – Lid Fabrication

Change: Add holes for bumpers.

Reason: Holes were specified on basket assembly drawing, but should be drilled prior to powder coating.

Effect: None.

Change: Stainless steel welding rod added to welding notes.

Reason: Lid prop lug material changed to stainless steel - see drawing 49216, Rev. 1.

Effect: None.

Change: Handle provisions changed to reference drawing 84263.

Reason: More detail for lid assembly. No change to finished assembly.

Effect: None.

9.4.4 Drawing 95916 to Revision 1 – Filler Sheet Fabrication

Change: Alternate filler sheet added (item 03).

Reason: Original configuration used 2 pieces as the length exceeds standard sheet length of 8 feet. Sheets 10 feet in length are readily available so part can be made from 1 piece. Retained original parts in case 10 foot length is not available.

Effect: None.

9.4.5 Drawing 95926 to Revision 1 – Aft Attachment Hoop

Change: Add handle provisions.

Reason: Handle provisions are specified on the basket assembly drawing, but are easier to install in the hoop before the basket is assembled.

Effect: None.

9.5 Document Control List DCL959-11 to Revision 1 – Attachment Provisions Fabrication

9.5.1 Drawing 95931 to Revision 1 – Aft Beam Assembly

Change: Material for bushing (item 08) changed from brass to stainless steel

Reason: Incorrect material specified, part is stainless steel.

Effect: None.

9.6 Common Component Drawings

A number of drawings of components that are common to all Aero Design cargo baskets were revised as part of updating STC SH10-48 to issue 2. The revised drawings are also part of this approval, and are not changed from approval SH10-48 issue 2.

9.7 Document Control List DCL969-1 to Revision 1 – Cabin Steps Installation

9.7.1 Drawing 96901 to Revision 1 – Quick Release Step Installation

Change: Remove alternate configuration (sheet 3 and 4).

Reason: Alternate configuration used Bell 206L/407 step which did not locate the step in the same position as the original Bell 429 step. Alternate not necessary.

Effect: None.

9.8 Document Control List DCL969-11 to Revision 1 – Cabin Steps Fabrication

9.8.1 Drawing 96910 to Revision 1 – Fixed Step Fabrication

9.8.2 Drawing 96911 to Revision 1 – Quick Release Step Fabrication

Change: Drain holes added.

Reason: Omitted on original issue. Drain holes are present on all other steps.

Effect: None.

Change: Note 3 revised.

Reason: Note said to "powder coat prior to assembly". Powder coating must be done after welding.

Effect: None.

APPENDIX A

COMPLIANCE PROGRAM

CP959-1, REV. 1

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM CHECKLIST

APPLICANT: Aero Design Ltd.
9888A Malaspina Road
Powell River, BC, Canada, V8A 0G3

DATE: 31 January 2014
REV. No. 1 13 May 2014

MAKE: Bell Helicopter
MODEL: 429

CORRESPONDANCE TO:
(If other than applicant)

REGISTRATION: All Applicable
SERIAL No.: All Applicable

NATURE OF WORK: Installation of Side-Mounted External Cargo Basket - Basket Mounting Design Changes to suit S/N 57081 & sub.
This CP shows the paragraphs where demonstration of compliance has changed from TC accepted CP959, Rev. 2, indicated in column 2

MODEL CERTIFICATION BASIS: CAR527, Change 527-9 (see TCDS H-107, Issue 3)
MODIFICATION CERTIFICATION BASIS: CAR527, Change 527-9 (same as model basis of certification)

DAR = James Tinson
DAR No 304
NOV 04 2014

Airworthiness Requirement	Change from CP Rev. 2	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
Subpart B – Flight						
527.27	No	Centre of Gravity Limits	N/A			
527.29	Yes	Empty Weight and Corresponding C of G	Data specified on inst'n drawing			No change from Type Approval. Change: New configuration weight
527.51	No	Takeoff	Flight Test			
527.65	No	Climb: All Engines Operating	Flight Test			
527.67	No	Climb: One Engine Inoperative	Flight Test			
527.71	No	Gliding Performance	Flight Test			
527.75	No	Landing	Flight Test			
527.141	No	Flight Characteristics – General	Flight Test			
527.143	No	Controllability and Maneuverability	Flight Test			
527.171	No	Stability – General	Flight Test			
527.173	No	Longitudinal Stability	Flight Test			
527.175	No	Demonstration of Longitudinal Stability	Flight Test			
527.177	No	Static Directional Stability	Flight Test			
527.231	No	Ground and Water Handling - General	Flight Test			
527.241	No	Ground Resonance	Flight Test			
527.251	No	Vibration	Flight Test			

Subpart C – Strength Requirements

527.301 No Loads – Air Drag Loads Analysis

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM CHECKLIST

Airworthiness Requirement	Change from CP Rev. 2	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
527.301	No	Loads – Inertia Loads	Compliance with 527.337 and 527.561			
527.301	Yes	Loads – Air Drag Loads	Analysis and Test iaw Test Plan TR959.05	X		Solid lid and front end were not considered in original certification.
527.303	No	Factor of Safety	Analysis			
527.305	Yes	Strength and Deformation			X	
527.307	Yes	Proof of Structure	Analysis and Test iaw Test Plan		X	
527.337(a)	No	Limit Maneuvering Load Factor – Positive	TR959.04 and TR959.05			Critical load factor in downward direction.
527.547	No	Main Rotor Structure	Flight Test			See comments for flight test above
527.561		Emergency Landing Conditions				
527.561(a)	No	General	N/A			Paragraphs (b)-(d) do not apply to this installation
527.561(b)	No	Structure Design	N/A			Not an item of mass inside the cabin that could endanger the occupants of the cabin
527.561(c)	No	Supporting Structure Design	N/A			Not an item of mass located above or behind the occupants of the cabin
527.561(d)	No	Fuselage Structure near fuel tanks	N/A			Not structure in the area of internal fuel tanks

Subpart D – Design and Construction

527.601	No	Design	Specification on Drawings			Design is conventional.
527.603	Yes	Materials	Specification on Drawings	X		Materials used are specified in Mil-Hdbk-5J.
527.605(a)	No	Fabrication Methods	Specification on Drawings			Design is conventional.
527.609	No	Protection of Structure	Specification on Drawings			
527.611	No	Inspection Provisions	Specification on Drawings			Design is easy to inspect.
527.613	Yes	Material Strength Properties and Design Values	Values used as per Mil-Hdbk-5J	X		
527.625	No	Fitting Factor	Analysis			
527.727	No	Reserve Energy Absorption Drop Test	Statement in Report			Installation does not exceed ground clearance required to meet reserve energy drop test as specified by Bell Helicopters.
527.783	No	Doors	N/A			Installation does not block doors.
527.787(a)	No	Cargo and Baggage Compartments	Compliance with 23.301 through 307			
527.787(b)	No	Cargo and Baggage Compartments	Design			Basket is a closed container.
527.787(c), (d)	No	Cargo and Baggage Compartments	N/A			Cargo is external to helicopter.
527.807	No	Emergency Exits	N/A			Installation does not block doors.

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM CHECKLIST

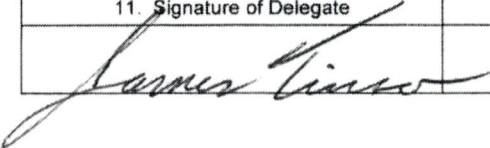
Airworthiness Requirement	Change from CP Rev. 2	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
527.865	No	External Load Attaching Means	N/A			Cargo basket is classified as a cargo compartment
527.1387	No	Position Light System Dihedral Angles	Statement			Position lights located on outboard sides of vertical fins on horizontal stabilizer. Basket installation does not extend outboard of vertical fins.
527.1401	No	Anti-collision Light System	Statement			Anticollision light located on top of vertical fin. Basket has no significant effect on visibility of anticollision light.

Subpart G – Operating Limitations and Information

527.1505	No	Never Exceed Speed	Flight Test,			V _{NE} limited to 130 kts, established by flight test
527.1525	No	Kinds of Operation	Flight Manual Supplement			
527.1529	Yes	Instructions for Continuing Airworthiness	ICA Provided	X		
527.1557(a)	No	Miscellaneous Markings and Placards – Baggage Compartments	Placard provided			
527.1557(b)	No	Miscellaneous Markings and Placards	N/A			
527.1557(c)	No	Miscellaneous Markings and Placards	N/A			
527.1557(d)	No	Miscellaneous Markings and Placards	N/A			
527.1581	Yes	Rotorcraft Flight Manual – General	Flight Manual Supplement	X		Change: weight and balance
527.1583(c)	No	Operating Limitations – Weight and Loading Information	Flight Manual Supplement			
527.1585	No	Operating Procedures	Flight Manual Supplement			
527.1587	No	Performance Information	Flight Manual Supplement			
527.1589	No	Loading Information	Flight Manual Supplement & Placard			Placard installed on basket

Transport
CanadaTransports
Canada

MINISTERIAL DELEGATE STATEMENT OF COMPLIANCE WITH THE CERTIFICATION BASIS

1. Reference No. NAPA File; C-14-0212 Aero Design Project #; 959-1 Wings Engineering Project No.; WPN1402		2. Applicant Name Aero Design Ltd.	
Part 1: Identification of Aeronautical Product			
3. Applicable Design Approval Document No. TCCA TCDS No.; H-107, Issue 3			
4. Model No. 429		5. Make Bell Helicopter Textron Canada Limited (BHTC)	
6. Type (aircraft, engine, propeller, appliance, part) Helicopter			
Part 2: Substantiating Reports and Data			
7. Number See continuation sheets.		8. Title See continuation sheets.	
9. Purpose of Finding of Compliance Revise STC SH12-58 to Issue 3 law Certification Plan CP959.10 Revision 2 - Major basket design changes required to suit revised airframe mounts by BHTC - BHTC provided design data wrt attachment points. See ER959.03 Rev 0, Appendix B. - BHTC successfully completed a basket Fit Check on SN57081 at their Mirabel facility. See PSE letter. - Minor changes noted in CP959.10 Rev 2, Section 9, updates to; dwg templates, hwr PNs, parts lists, etc. - See CP959.10 Rev 2, Appendix B, Changed Documents for the listing of major and minor changes.			
10. Applicable Elements of Certification Basis See CP959.10 Rev 2, Appendix A, Compliance Program Checklist, CP959-1, Revision 1 - DAR 304 is addressing FoC requirements wrt major changes for the DCL drawings and reports noted per Boxes 7 & 8. - TCCA approved and accepted documents as noted in CP959.10 Rev 2: > Basket FMS959.90 Rev2 and Step FMS969.90 Rev 2 are approved by TCCA. > Basket ICA959.91 Rev1 and Step ICA969.91 Rev 1 are accepted by TCCA.			
Part 3: Ministerial Delegate Finding of Compliance with the Certification Basis			
Under the authority vested in me by the Minister under subsection 4.3(1) of the Aeronautics Act, I hereby find that the type design of the aeronautical product is in compliance with the certification basis as demonstrated by the applicant's substantiating reports and data to the best of my knowledge.			
11. Signature of Delegate	12. Name	13. Delegate No.	14. Date (yyyy-mm-dd)
	James Tinson	304	2014-11-04



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MINISTERIAL DELEGATE STATEMENT OF COMPLIANCE WITH THE CERTIFICATION BASIS

7. Number (Continued from Sheet 1)	Rev	8. Title (Continued from Sheet 1)
DCL959-1	2	Document Control List – Cargo Basket Installation - Configuration B
95905	0	Cargo Basket Installation (S/N 57081 and sub.)
DCL959-2	2	Document Control List – Mounting Provisions Installation - Configuration A
95906	0	Mounting Provisions Installation (S/N 57081 and sub.)
95907	0	External Attachment Provisions Installation (S/N 57081 and sub.)
DCL959-15	0	Document Control List – Cargo Basket Fabrication
95950	0	Cargo Basket Assembly
95951	0	Basket Fabrication
95912	1	Lid Fabrication
95964	0	Basket Components - Forward Attachment Hoop
95965	0	Basket Components - Forward Sheet
95916	0	Basket Components - Filler Sheets
95917	0	Basket Components - Lid Checker Plate
95926	1	Basket Components - Aft Attachment Hoop
95927	1	Basket Components - Placard
94520	1	Basket Components - Hoop
49215	1	Basket Components - Spacer
49216	1	Basket Components - Spacer
84240	0	Lid Brace Installation
84255	2	Handle Assembly
84261	2	Handle Bar Assembly
84262	1	Basket Handle Provisions Assembly
84263	0	Lid Handle Provisions Assembly
84265	2	Handle Lever
84267	1	Handle Bracket
84272	1	Bushing
36273	2	Lid Bracket
36274	3	Bushing
36275	4	Bushing
36277	1	Handle Bar
36278	3	Spring
36280	3	Brace

MINISTERIAL DELEGATE STATEMENT OF COMPLIANCE WITH THE CERTIFICATION BASIS

[illegible]



INSTRUCTIONS FOR COMPLETION OF THE FORM MINISTERIAL DELEGATE FINDING OF COMPLIANCE WITH THE CERTIFICATION BASIS

- Block 1 - Enter a number unique to the originator or applicant for the type design approval to which the finding of compliance pertains. In the case where a new or amended design approval document will be issued, the number should be either the NAPA project number. In the case where a NAPA project number is not generated the reference number should be one generated and controlled by the applicant.
- Block 2 - Enter the name of the applicant who applied for the type design approval.
- Block 3 - In the case of findings of compliance for the initial type design approval of an aeronautical product this block would be left blank or as an example, add the Certification Plan report number. Otherwise enter the number of the applicable design approval document type affected. Typically this will refer to the type certificate or Canadian Technical Standard Order (CAN-TSO) design approval against which the requested type design approval would apply. "Model series XX" is not acceptable.
- Block 4 - Enter each model as listed on the type certificate data sheet for the affected aeronautical product. In the case of a new aeronautical product, print or type the model to be listed on the TCDS for the aeronautical product.
- Block 5 - Enter either the model series or the specific model number, as appropriate and as listed on the type certificate data sheet for the aeronautical product. If the requested type design approval is applicable to multiple models, list them separately. If the type design approval is for an appliance, part or component, separate from a type certification project, enter the model number of the appliance, part or component.
- Block 6 - Enter the type of aeronautical product as listed on the product's data sheet, or describe the appliance, part or component.
- Block 7 - Enter the number and revision level of the reports, drawings, analysis and documents.
- Block 8 - Enter the titles of all the applicable reports, drawings, analysis, or documents in this block. If there is not enough space additional pages may be attached. The delegate or authorized person must reference all reports and data that is generated in support of the requested type design approval: drawing numbers with change letters, report numbers with revision levels dates, and so forth. If the particular finding of compliance form does not cover all applicable elements, enter an explanatory statement, for example: "This finding of compliance is for the above engineering design data only." It indicates the data listed above demonstrates conformity of the type design of the aeronautical product only with those requirements specified by paragraph and subparagraph listed below as "applicable elements of the certification basis".
- Block 9 - Enter the type of project (ie, type certificate, Canadian Technical Standard Order (CAN-TSO) design approval, supplemental type certificate, etc) and the number of the design approval document that is to be issued, if known. Provide a brief description of the purpose for the requested type design approval and to what the specific findings of compliance apply. If this finding of compliance pertains to a revision of a manual, such as the aircraft flight manual, which will not require reissue of the corresponding design approval document as specified in block 3, then block 9 should have a statement that the design approval document specified in block 3 does not require reissue. This finding of compliance is for records purpose only.
- Block 10 - Enter the applicable elements of the certification basis at the section, subsection, paragraph, or other level as appropriate. This list is to include the applicable amendment levels. If the list is too long, attach additional sheets or refer to appropriate compliance documentation such as a Certification Plan if applicable. It is not sufficient for the delegate, or authorized person within an organizational delegate, to merely indicate "structural regulations" or to use other generalizations.
- Block 11 - The delegate, or authorized person within an organizational delegate, signs in this block.
- Block 12 - Enter the name of the delegate, or authorized person within an organizational delegate, in this block.
- Block 13 - Enter the delegation number of the delegate, or authorized person within an organizational delegate, in this block. In the case of an authorized person, enter the authorized person's number followed by the number of the organizational delegate.
- Block 14 - Enter the date the delegate, or authorized person within an organizational delegate, signs the form after making the finding(s) that the listed substantiating reports and data demonstrated that the type design of the aeronautical product conformed to the applicable certification basis.
- General - Each Design Approval Organization or Approved Engineering Organization can choose to create their own Finding of Compliance form provided it satisfies the intent as shown on the current form.**

APPENDIX B

CHANGED DOCUMENTS

Number	Title	Rev (current approved)	Rev Description of change (new)
SH12-58	Transport Canada STC	2	3 Add new configuration, new address
10043360	EASA STC	1	2 Add new configuration, new address
SR03317NY	FAA STC	original	(amend) Add new configuration, new address
CP959-1	Compliance Program	--	1 New document - shows changes from TC accepted CP959 Rev. 2
DCL959-1	Document Control List - Basket Installation	1	2 Add new configuration, new address
95901	Cargo Basket Installation - S/N 57080 and prev.	0	1 TB (title block updated for new address), lid brace
95905	Cargo Basket Installation - S/N 57081 and sub.	--	0 New drawing
FMS959.90	Flight Manual Supplement - Cargo Basket	1	2 Add new configuration, new address
ICA959.91	Instructions for Continued Airworthiness - Cargo Basket	0	1 Add new configuration, new address
DCL959-2	Document Control List - Mounting Provisions Installation	1	2 Add new configuration, new address
95902	Mounting Provisions Installation - S/N 57080 and prev.	0	1 TB, metric units, step removed w&b
95906	Mounting Provisions Installation - S/N 57081 and sub.	--	0 New drawing
95907	External Attachment Provisions Installation - S/N 57081 and sub.	--	0 New drawing
FMS959.90	Flight Manual Supplement - Cargo Basket	1	2 (above, DCL959-1)
ICA959.91	Instructions for Continued Airworthiness - Cargo Basket	0	1 (above, DCL959-1)
DCL959-11	Document Control List - Basket Assembly - S/N 57080 and prev.	0	1 Changes below, new address
95910	Cargo Basket Assembly	0	1 TB, h/w updated, sealant changed, alt. filler sheet
95911	Basket Fabrication	0	1 TB, welds increased, welding notes
95912	Lid Fabrication	0	1 TB, 84262 updated to 84263, welding notes
95915	Basket Components - Forward Sheet	0	1 TB
95916	Basket Components - Filler Sheets	0	1 TB, full length part added
95917	Basket Components - Lid Checker Plate	0	1 TB
95925	Basket Components - Forward Attachment Hoop	0	1 TB
95926	Basket Components - Aft Attachment Hoop	0	1 TB, handle prov.
95927	Basket Components - Placard	0	1 TB, Add new configurations
94520	Basket Components - Hoop	0	1 TB
49215	Basket Components - Spacer	0	1 TB, alternate material
49216	Basket Components - Spacer	0	1 TB, alternate material
84240	Lid Brace Installation	--	0 New drawing
84255	Handle Assembly	1	2 TB
84261	Handle Bar Assembly	1	2 TB
84262	Basket Handle Provisions Assembly	1	2 TB
84263	Lid Handle Provisions Assembly	--	0 New drawing - gives assembly a P/N, no changes
84265	Handle Lever	1	2 TB
84267	Handle Bracket	0	1 TB
84272	Bushing	0	1 TB
36273	Lid Bracket	1	2 TB

Number	Title	Rev	Rev Description of change
		(current approved)	(new)
DCL959-11	(Continued)		
36274	Bushing	2	3 TB
36275	Bushing	3	4 TB
36277	Handle Bar	0	1 TB
36278	Spring	2	3 TB
36280	Brace	2	3 TB
ER959.01	Engineering Report - Basket Installation	0	0 No change
ER959.02	Engineering Report - Load Test	0	0 No change
ER842.01	Engineering Report - Handle Assembly	0	0 No change
	Flight Test Report – Transport Canada	--	-- No change
DCL959-12	Document Control List - Mounting Provisions Fabrication - S/N <57080	0	0 Changes below, new address
95920	Forward Fitting Fabrication	0	1 TB
95921	Aft Fitting Fabrication	0	1 TB
95922	Plates Fabrication	0	1 TB
95923	Bushing Fabrication	0	1 TB
95930	Forward Beam Fabrication	0	1 TB, alt. finish
95931	Aft Beam Fabrication	0	1 TB, bushing material corrected, alt. finish
ER959.01	Engineering Report - Basket Installation	0	0 No change
ER959.02	Engineering Report - Load Test	0	0 No change
ER842.01	Engineering Report - Handle Assembly	0	0 No change
	Flight Test Report – Transport Canada	--	-- No change
DCL959-15	Document Control List - Basket Assembly - S/N 57081 and sub.	--	0 New document
95950	Cargo Basket Assembly	--	0 New drawing
95951	Basket Fabrication	--	0 New drawing
95912	Lid Fabrication	--	1 (above, DCL959-11)
95964	Basket Components - Forward Attachment Hoop	--	0 New drawing
95965	Basket Components - Forward Sheet	--	0 New drawing
95916	Basket Components - Filler Sheet	--	1 (above, DCL959-11)
95917	Basket Components - Lid Sheet	--	1 (above, DCL959-11)
95926	Basket Components - Aft Attachment Hoop	--	1 (above, DCL959-11)
95927	Basket Components - Placard	--	1 (above, DCL959-11)
94520	Basket Components - Hoop	--	1 (above, DCL959-11)
49215	Basket Components - Spacer	--	1 (above, DCL959-11)
49216	Basket Components - Spacer	--	1 (above, DCL959-11)
84240	Lid Brace Installation	--	0
84255	Handle Assembly	--	2 (above, DCL959-11)
84261	Handle Bar Assembly	--	2 (above, DCL959-11)
84262	Handle Bracket Assembly	--	2 (above, DCL959-11)
84263	Lid Handle Provisions Assembly	--	0

Number	Title	Rev	Rev Description of change
		(current approved)	(new)
DCL959-15	(continued)		
84265	Handle Lever	--	2 (above, DCL959-11)
84267	Handle Bracket	--	1 (above, DCL959-11)
84272	Bushing	--	1 (above, DCL959-11)
36273	Lid Bracket	--	2 (above, DCL959-11)
36274	Bushing	--	3 (above, DCL959-11)
36275	Bushing	--	4 (above, DCL959-11)
36277	Handle Bar	--	1 (above, DCL959-11)
36278	Spring	--	3 (above, DCL959-11)
36280	Brace	--	3 (above, DCL959-11)
ER959.01	Engineering Report - Basket Installation	--	0 (above, DCL959-11)
ER959.02	Engineering Report - Load Test	--	0 (above, DCL959-11)
ER842.01	Engineering Report - Handle Assembly	--	0 (above, DCL959-11)
	Flight Test Report – Transport Canada	--	-- (above, DCL959-11)
ER959.03	Engineering Report - S/N 57081 and sub. Configuration	--	0 New document
TR959.04	Test Plan and Report - Attachment Fitting	--	0 New document
TR959.05	Test Plan and Report - Lid and Forward Panels	--	0 New document
DCL959-16	Document Control List - Mounting Provisions Fabrication	--	0 New document
95940	Fittings Fabrication	--	0 New drawing
95942	Plates Fabrication	--	0 New drawing
95923	Bushing Fabrication	--	1 (above, DCL959-12)
95932	Forward Beam Fabrication	--	0 New drawing
95933	Aft Beam Fabrication	--	0 New drawing
ER959.01	Engineering Report - Basket Installation	--	0 (above, DCL959-12)
ER959.02	Engineering Report - Load Test	--	0 (above, DCL959-12)
ER842.01	Engineering Report - Handle Assembly	--	0 (above, DCL959-12)
	Flight Test Report – Transport Canada	--	-- (above, DCL959-12)
ER959.03	Engineering Report - S/N 57081 and sub. Configuration	--	0 New document
TR959.04	Test Plan and Report - Attachment Fitting	--	0 New document
TR959.05	Test Plan and Report - Lid and Forward Panels	--	0 New document

Number	Title	Rev	Rev Description of change
		(current approved)	(new)
DCL969-1	Document Control List - Cabin Steps Installation	1	2 Add new configuration, new address
96901	Fixed Cabin Step Installation - S/N 57080 and prev.	0	1 TB
96902	Quick Release Cabin Step Installation - S/N 57080 and prev.	0	1 TB, remove alternate config., correct error in w&b
96905	Fixed Cabin Step Installation - S/N 57081 and sub.	--	0 New drawing
96906	Quick Release Cabin Step Installation - S/N 57081 and sub.	--	0 New drawing
FMS969.90	Flight Manual Supplement - Steps	1	2 Add new config., remove alt. config
ICA969.91	Instructions for Continued Airworthiness - Steps	0	1 Add new config, new address, remove alt. config.
DCL969-11	Document Control List - Cabin Steps Fabrication	0	1 Changes below, new address
96910	Fixed Step Assembly	0	1 TB, drain holes, finish note
96911	Quick Release Step Assembly	0	1 TB, drain holes, finish note
96920	Fixed Step Brackets	0	1 TB
96921	Quick Release Step Brackets	0	1 TB
80010	Quick Release Step Assembly (Alternate)	1	-- Removed - not required as alternate
80020	Quick Release Step Brackets	0	-- Removed - not required as alternate
ER969.01	Engineering Report	0	0 no change
DCL704-429	Document Control List - Modifications	0	1 Changes below, new address
70403	Auxiliary Latch Modification	4	5 TB, model list, P/Ns, (04) material, weld notes
70408	Installation, Hangar Wheel	0	1 TB, hardware, typo
70428	Assembly, Hangar Wheel	0	1 TB, hardware, subassembly removed
70438	Parts, Hangar Wheel	0	1 TB, chamfer, hole, anodizing
ER704.02	Engineering Report - Lid Door Modification	0	-- Removed - does not apply to above configurations



DESIGN CHANGE APPROVAL APPLICATION

DEMANDE D'APPROBATION D'UNE MODIFICATION DE LA CONCEPTION

Legal name and address of applicant Nom et adresse légal du demandeur Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada V8A 0G3	Legal name and address of prospective holder Nom et adresse légal du titulaire éventuel Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada V8A 0G3	Name and address for billing purposes (if different than applicant) Nom et adresse aux fins de facturation (si différent du demandeur)
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Identification of aeronautical product / Identification du produit aéronautique				
Make / Marque Bell	Model / Modèle 429	Registration / Immatriculation All eligible	Serial No. / N° du série All eligible	Part No. / N° de la pièce

Request for (check appropriate box) / Objet de la demande (Cochez les carrés selon le cas)		Type Design Examination by Foreign Authority Examen de la définition de type par autorité étrangère
<input type="checkbox"/> STC CTS	<input type="checkbox"/> Repair Design Approval (RDA) Approbation de la conception de réparation (ACR)	<input checked="" type="checkbox"/> Application to a foreign authority is requested La demande à une autorité étrangère est demandée. <input type="checkbox"/> Type design examination of foreign change Examen de la définition de type modification étrangère Identify Identifier EASA
<input type="checkbox"/> STC (single serial number) CTS (numéro de série simple)	<input type="checkbox"/> Repair Design Approval - Process Repair ACR - Processus de réparation	
<input type="checkbox"/> STC (multiple serial numbers) CTS (numéros de série multiples)	<input type="checkbox"/> Part Design Approval (PDA) Approbation de la conception de pièce (ACP)	
<input type="checkbox"/> Type Certificate Revision Revision de certificat de type		
<input type="checkbox"/> Revision No. Révision N°	Current Issue Édition active	

<input type="checkbox"/> Restricted Category Catégorie restreinte	Type of Operation Type d'opération
--	---------------------------------------

Title and brief description of modification, repair or replacement part, including effects of changes (use additional pages if necessary). Refer to CAR 521.155(b)(i) for details.
Titre et brève description de la modification, de la réparation ou de la pièce de rechange, y compris les effets des changements (utiliser des feuilles supplémentaires si nécessaire).
Référez-vous à RAC 521.155(b)(i) pour des détails.

Cargo basket mounting design changes to suit S/N 57081 & sub. See project summary PS959-1 for complete description of changes.

Applicable Type Certificate (TC) / Certificat de type (CT) pertinent		
TC No. / N° de CT H-107	Issue No. / N° de l'édition 3	Identify State of Design / Identifier l'état de conception Canada

The applicant is responsible for the control of product manufacture / Le demandeur est responsable du contrôle de la fabrication du produit

☒ Yes / Oui ☐ No / Non If no, identify who is responsible / Si non, identifier qui est responsable

Documentation to be submitted Documentation à soumettre	Applicant Demandeur	
	Submitted Soumis	
	Yes Oui	No Non
Proposed certification basis Proposition de base de certification		<input checked="" type="checkbox"/>
Certification plan in accordance with CAR 521.155(d) Plan de certification selon RAC 521.155(d)		<input checked="" type="checkbox"/>

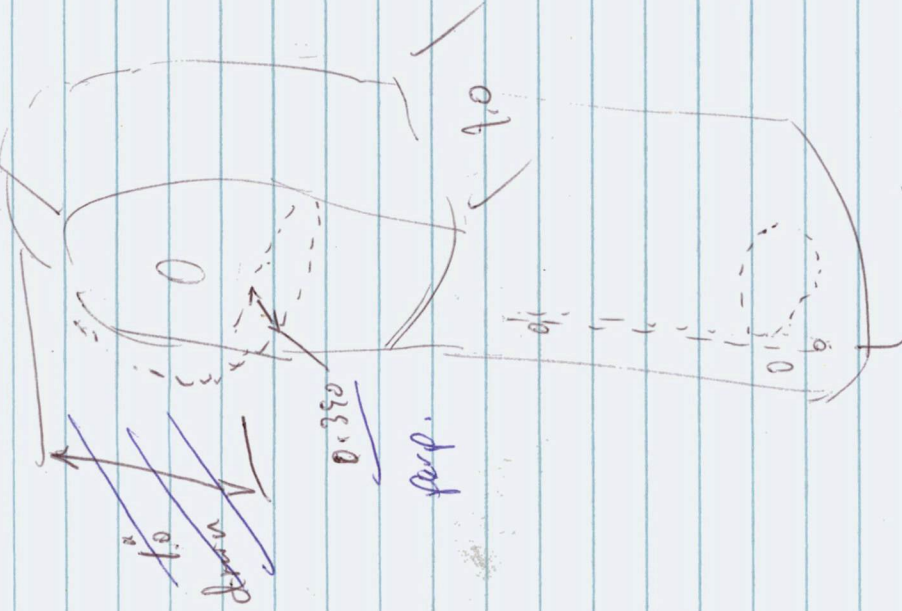
Applicant's remarks / Remarques du demandeur

Application to EASA to amend STC 10043360 Rev. 1 based on TCCA STC SH12-58 Issue 3.

I hereby certify that the information contained herein is correct and complete. I agree to pay charges as prescribed in Part 1, Subpart 4 of the CARs (CAR 104-Charges).
Je certifie que les renseignements figurant ci-dessus sont exacts et complets. Je m'engage à payer les redevances prescrites à la sous-partie 4 de la partie I du RAC (sous-partie 104 du RAC - Redevances).

JEFF CLARKE Name and Signature of Applicant / Nom et signature du demandeur	VICE PRESIDENT Title / Poste	23 2014-12-03 Date (yyyy-mm-dd) / Date (aaaa-mm-jj)
---	--	---

large face



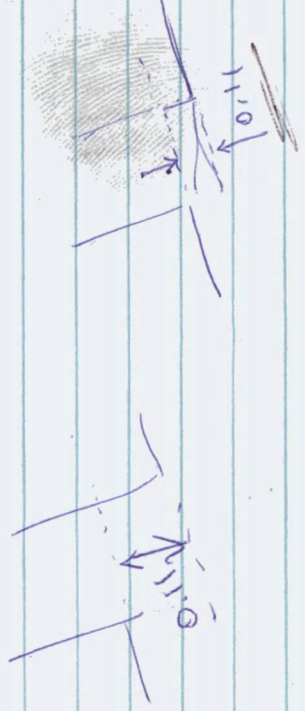
aft fitting

hole close

0.390 / 1.590

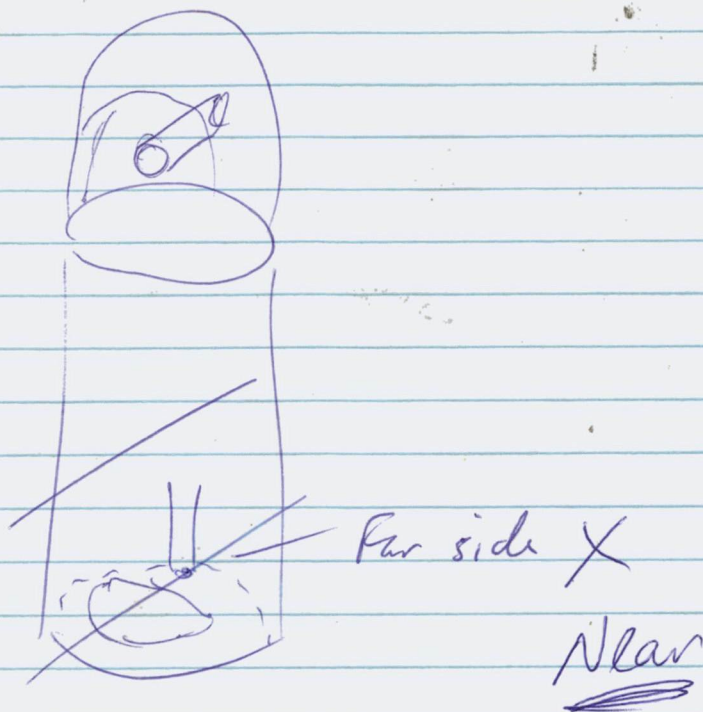
1.500
1.890

1.375 deep.



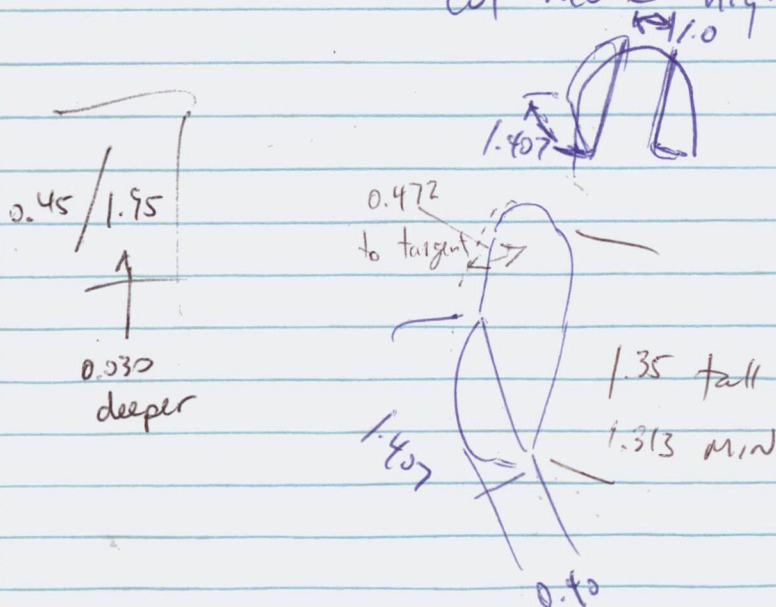
1.120

Forward.



← CW 6.41° LH PART

TIP HEAD towards me. 6.35°
- cut more high





South Terminal 204-4440 Cowley Crescent Richmond, B.C. V7B 1B8 Ph 1-800-663-2872 Fax 604-273-6864 www.pacificcoastal.com Tax Registration: R121386296

RESERVATION CONFIRMATION**Passenger**

Name	Reservation #	Total Charges	Total Tax	Total Amount	Total Payments	Balance Due
CLARKE BRIAN JEFFREY	1809065	344.20	17.22	361.42	361.42	0.00

Itinerary

Leg	Date	From	To	Flight #	Status
1	06 Oct 2014	06:55 - POWELL RIVER	07:30 - VANCOUVER - South Terminal	200	CONFIRMED
2	08 Oct 2014	16:30 - VANCOUVER - South Terminal	17:05 - POWELL RIVER	217	CONFIRMED

Charges

Date	Passenger	Description	Amount	Tax	Total
01 Oct 2014	CLARKE, BRIAN JEFFREY	CLASSIC FARE	133.00	6.65	139.65
01 Oct 2014	CLARKE, BRIAN JEFFREY	Fuel Surcharge	6.00	0.30	6.30
01 Oct 2014	CLARKE, BRIAN JEFFREY	Nav Canada Fee	13.00	0.65	13.65
01 Oct 2014	CLARKE, BRIAN JEFFREY	Carbon Surcharge	4.10	0.21	4.31
01 Oct 2014	CLARKE, BRIAN JEFFREY	AIF - YVR	5.00	0.25	5.25
01 Oct 2014	CLARKE, BRIAN JEFFREY	ENCORE FARE	160.00	8.00	168.00
01 Oct 2014	CLARKE, BRIAN JEFFREY	Fuel Surcharge	6.00	0.30	6.30
01 Oct 2014	CLARKE, BRIAN JEFFREY	Nav Canada Fee	13.00	0.65	13.65
01 Oct 2014	CLARKE, BRIAN JEFFREY	Carbon Surcharge	4.10	0.21	4.31
Total			344.20	17.22	361.42

Payments

Date	Description	Payer	Method	Amount	PO	Receipt	Authorization
01 Oct 2014	MASTERCARD	CLARKE, BRIAN JEFFREY	CC CA	226.80		1998590	03393Z
01 Oct 2014	CREDIT TRANSFER	CLARKE, BRIAN JEFFREY	CREDIT	134.62		1998588	

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Itinerary confirmation

Thank you for choosing WestJet. You can find details about your booking below.

Your reservation code is: **WACFXD**

Guest details

Mr Brian Clarke Flight Vancouver (YVR)-Calgary (YYC)-Montreal (YUL), Montreal (YUL)-Calgary (YYC)-Vancouver (YVR)

Ticket number 8382101864650

Seat YVR-YYC YYC-YUL YUL-YYC YYC-YVR

* You may not select a seat at this time. Seat selection will be available in the 'Manage bookings' section of your WestJet profile, during online check-in, or at the airport.

Air itinerary details

Vancouver (YVR) Mon Oct 6 2014, 9:00 AM Boeing 737-800	Calgary (YYC) Mon Oct 6 2014, 11:20 AM	WS 664 WestJet	Fare type: Econo Non-stop
Calgary (YYC) Mon Oct 6 2014, 12:30 PM Boeing 737-700	Montreal (YUL) Mon Oct 6 2014, 6:32 PM	WS 218 WestJet	Fare type: Econo Non-stop
Montreal (YUL) Wed Oct 8 2014, 7:00 AM Boeing 737-700	Calgary (YYC) Wed Oct 8 2014, 9:35 AM	WS 215 WestJet	Fare type: Econo Non-stop
Calgary (YYC) Wed Oct 8 2014, 10:20 AM Boeing 737-800	Vancouver (YVR) Wed Oct 8 2014, 10:47 AM	WS 447 WestJet	Fare type: Econo Non-stop

Pricing breakdown

Guest type	Base fare per guest	Air transportation charges per guest	Taxes, fees and charges per guest	Total fare per guest	Number of guests	Total fare
Adult	\$794.00	\$46.00	\$106.70	\$946.70	x 1	\$946.70 CAD

YVR-YUL: Econo fare type benefits

First checked bag fee of \$25-29.50 CAD (for flights within Canada or to/from the U.S. for travel after October 28, 2014)

Second checked bag fee of \$25-29.50 CAD and excess checked baggage fee of \$75-88.50 CAD per eligible piece (for travel after October 28, 2014)

Second checked bag fee of \$20-23.60 CAD and excess checked baggage fee of \$50-59 CAD per eligible piece (for travel before October 29, 2014)

YUL-YVR: Econo fare type benefits

First checked bag fee of \$25-29.50 CAD (for flights within Canada or to/from the U.S. for travel after October 28, 2014)

Second checked bag fee of \$25-29.50 CAD and excess checked baggage fee of \$75-88.50 CAD per eligible piece (for travel after October 28, 2014)

Second checked bag fee of \$20-23.60 CAD and excess checked baggage fee of \$50-59 CAD per eligible piece (for travel before October 29, 2014)

Total airfare: **\$946.70 CAD**

Charged to MASTERCARD ...1612: \$946.70 CAD

Important details

WestJet permits one piece of carry-on baggage and one personal item on board. If you are on a flight operated by one of our partners, your allowance may be different - [learn more](#). All carry-on baggage must pass through security. Make sure your carry-on complies and avoid having to surrender your personal items. Review what you can - and can't - take on your flight by visiting our [restricted items](#) info page or [catsa.gc.ca](#).



Your checked baggage allowance depends on the aircraft you are travelling on, the fare option purchased and the destination you are travelling to or from. You may be permitted additional items, or items that are overweight or oversized in checked baggage. For more details, please see [Checked and excess baggage](#).



Use web check in to print your boarding pass and select your seat for free. This service is available as early as 24 hours (and up to 60 minutes) before your scheduled flight. Selecting some seats requires a fee.



Identification and travel documents required vary based on where you are travelling and may change based on your nationality. Visit our [ID requirements](#) section for more information.

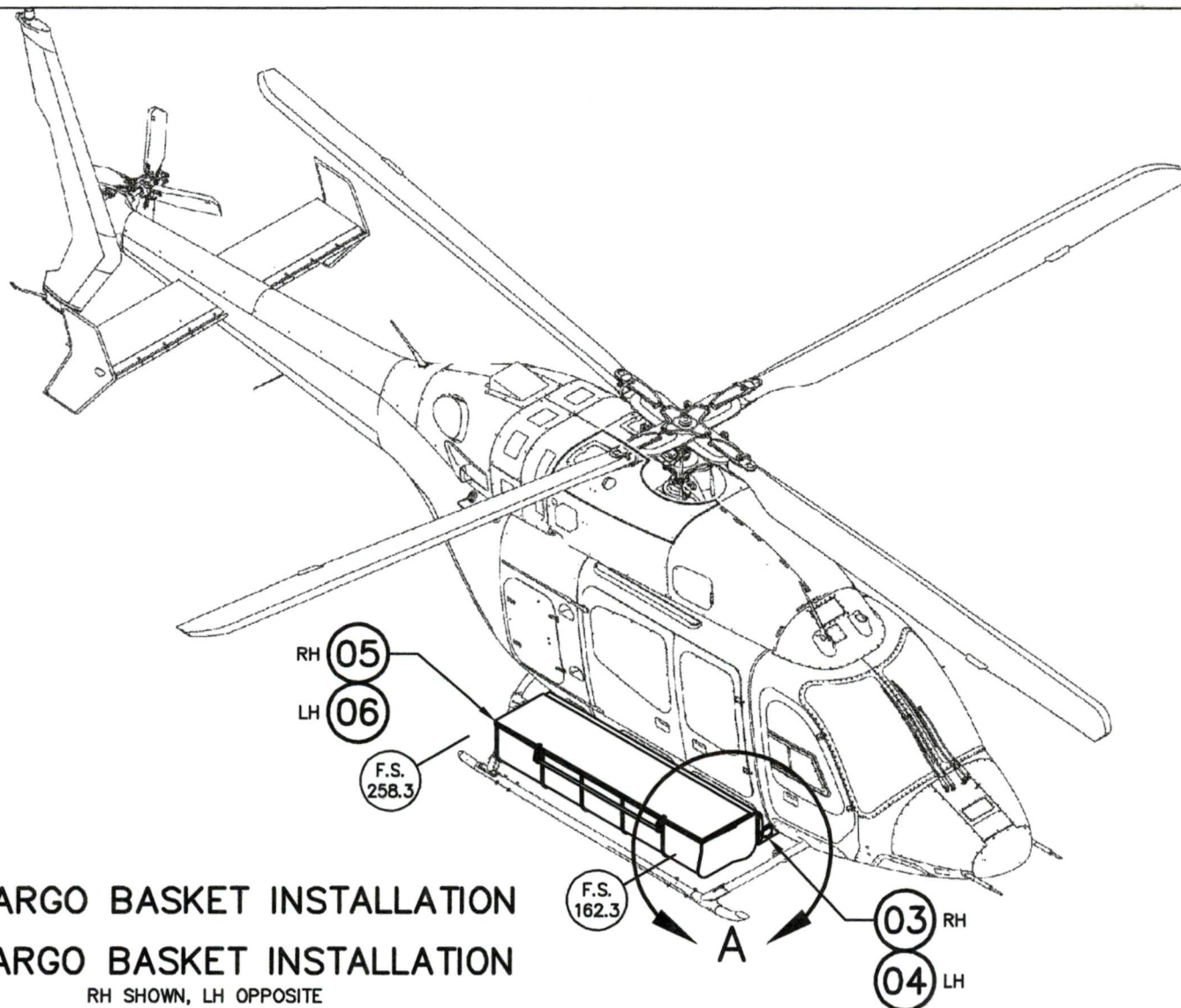


Do you have a special need? For information on travelling with oxygen, assistive devices, or a service animal see [Guests with special needs](#).




We know how valuable your time is. To ensure we are able to depart and arrive as scheduled, please be sure you are through security and at your departure gate 30 minutes prior to your flight's scheduled departure time. If you arrive at the gate less than 10 minutes prior to departure and the aircraft is already boarded you will be denied boarding.

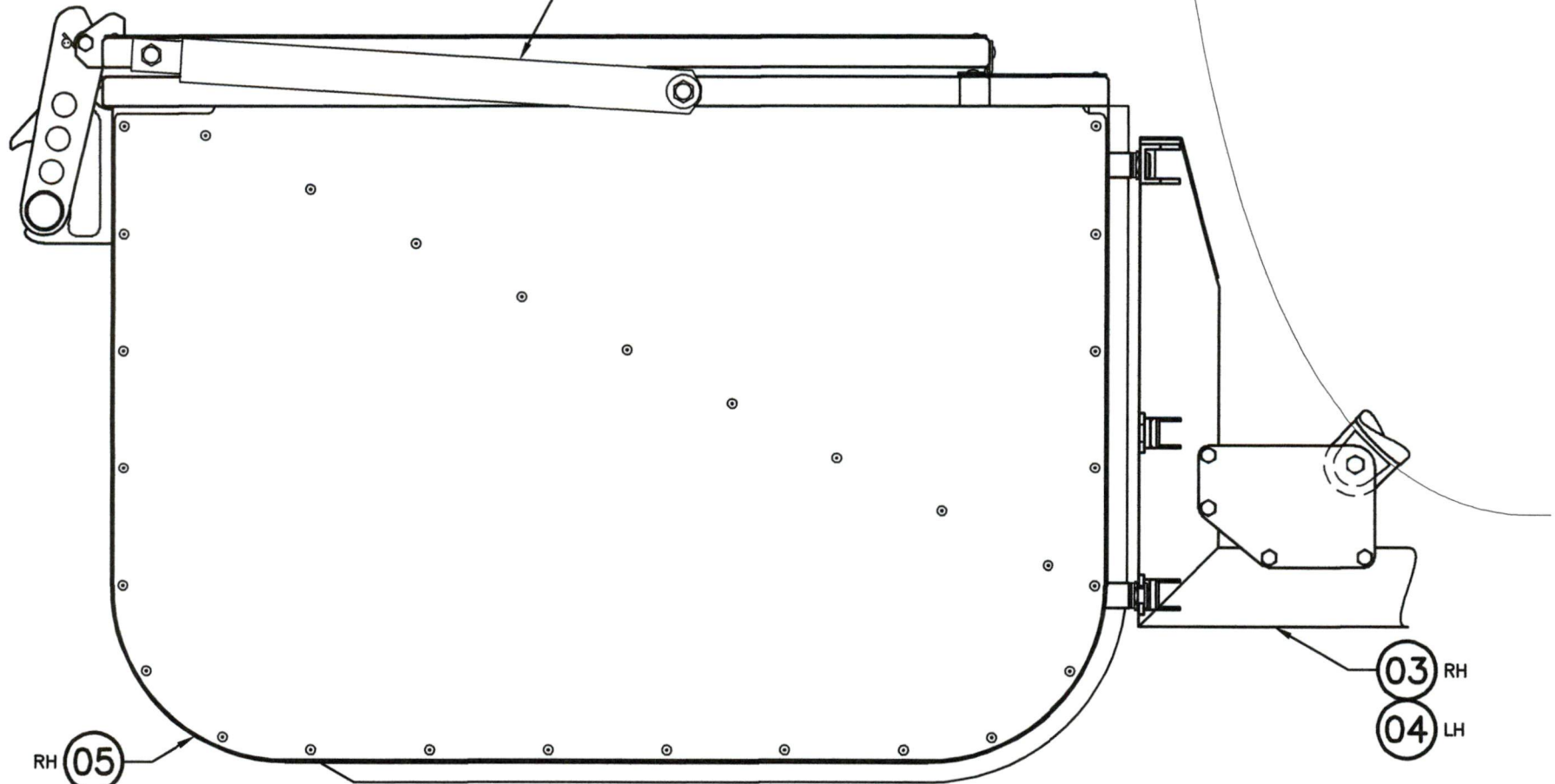
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01 RH CARGO BASKET INSTALLATION
 02 LH CARGO BASKET INSTALLATION
 RH SHOWN, LH OPPOSITE

APPROVALS		DATE			AERO DESIGN LTD. 9888A MALASPINA ROAD POWELL RIVER, BC, CANADA, V8A 0G8 TEL: 604.489.8876 www.aerodesign.ca		
DRAWN: JEFF CLARKE		31 JAN 2014					
CHECKED: JASON REKVE							
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2° X.XX ±0.03 X.X ±0.1				BELL 429 - S/N 57081 & SUB. QUICK RELEASE CARGO BASKET CARGO BASKET INSTALLATION			
NOT TO SCALE				DWG. SIZE	DWG. NO.	REV.	
SHEET 1 OF 3				A4	95905	0	

INSTALL LID BRACE IN ACCORDANCE
WITH DRAWING 84240



RH 05
LH 06

03 RH
04 LH

B.L.
44.70

DETAIL A

SCALE 1 : 4
LOOKING AFT AT FORWARD ATTACHMENT
AFT ATTACHMENT SIMILAR

APPROVALS	DATE
DRAWN: JEFF CLARKE	31 JAN 2014
CHECKED: JASON REKVE	

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DIMENSIONS ARE IN INCHES.
TOLERANCES ON:

DECIMALS	ANGLES
X.XXX ±0.010	±1/2°
X.XX ±0.03	
X.X ±0.1	



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BELL 429 - S/N 57081 & SUB.
QUICK RELEASE CARGO BASKET
CARGO BASKET INSTALLATION

SCALE 1 : 4	DWG. SIZE	DWG. NO.	REV.
SHEET 2 OF 3	A4	95905	0

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REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE - CREATED FROM 95901, REV. 1	*	*

NOTES

1. INSTALLATION OF MOUNTING PROVISIONS IN ACCORDANCE WITH DRAWING 95906 AND 95907 IS REQUIRED PRIOR TO THIS INSTALLATION.
2. REFER TO FLIGHT MANUAL SUPPLEMENT FMS959.90 FOR FLIGHT LIMITATIONS AND INFORMATION.
3. REFER TO INSTRUCTIONS FOR CONTINUED AIRWORTHINESS ICA959.91 FOR MAINTENANCE INFORMATION.
4. BASKET INSTALLATION INSTRUCTIONS:
 - A) HOOK UPPER FORWARD ATTACHMENT INTO UPPER KEYWAY IN FORWARD MOUNTING BEAM.
 - B) LIFT BASKET FROM AFT END, SLIDE LOWER FORWARD ATTACHMENT INTO LOWER KEYWAY AND PULL BASKET AFT.
 - C) LIFT BASKET TO AFT MOUNTING BEAM, ENGAGE AFT ATTACHMENTS INTO KEYWAYS IN AFT BEAM.
 - D) PUSH BASKET DOWN TO LOCK BASKET INTO AFT BEAM, PIN WILL SPRING INTO PLACE WITH A SNAP.
 - E) CHECK THAT BASKET IS LOCKED IN PLACE BY ATTEMPTING TO LIFT AFT END OF BASKET.
5. WEIGHT AND BALANCE GIVEN FOR RIGHT SIDE, LATERAL ARMS FOR LEFT SIDE ARE NEGATIVE.

WEIGHT AND BALANCE - METRIC

ITEM	DESCRIPTION	WEIGHT (kg)	LONGITUDINAL		LATERAL (NOTE 5)	
			ARM (mm)	MOMENT (mm-kg)	ARM (mm)	MOMENT (mm-kg)
03/04	PROVISIONS INSTALLATION	14.74	5088.3	75010	71.0	1047
05/06	CARGO BASKET ASSEMBLY	36.11	5342.6	192901	1135.4	40994
01/02	CARGO BASKET INSTALLATION	50.85	5268.9	267911	826.8	42041
	CARGO (MAXIMUM, CENTERED)	136.08	5342.6	727015	1135.4	154500

WEIGHT AND BALANCE - STANDARD

ITEM	DESCRIPTION	WEIGHT (LB)	LONGITUDINAL		LATERAL (NOTE 5)	
			ARM (IN)	MOMENT (LB-IN)	ARM (IN)	MOMENT (LB-IN)
03/04	PROVISIONS INSTALLATION	32.5	200.33	6510.57	2.79	90.83
05/06	CARGO BASKET ASSEMBLY	79.6	210.34	16743.06	44.70	3558.12
01/02	CARGO BASKET INSTALLATION	112.1	207.44	23253.63	32.55	3648.95
	CARGO (MAXIMUM, CENTERED)	300.0	210.34	63102.00	44.70	13410.00

1		95950-01-02	06	LH CARGO BASKET ASSEMBLY
	1	95950-01-01	05	RH CARGO BASKET ASSEMBLY
1		95906-01-02	04	LH MOUNTING PROVISIONS INSTALLATION
	1	95906-01-01	03	RH MOUNTING PROVISIONS INSTALLATION
		95905-01-02	02	LH CARGO BASKET INSTALLATION
		95905-01-01	01	RH CARGO BASKET INSTALLATION
02	01	PART NO.	ITEM	DESCRIPTION
QTY	QTY	LIST OF MATERIALS		

APPROVALS	DATE
DRAWN: JEFF CLARKE	31 JAN 2014
CHECKED: JASON REKVE	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES.
TOLERANCES ON:
DECIMALS ANGLES
X.XXX ±0.010 ±1/2"
X.XX ±0.03
X.X ±0.1

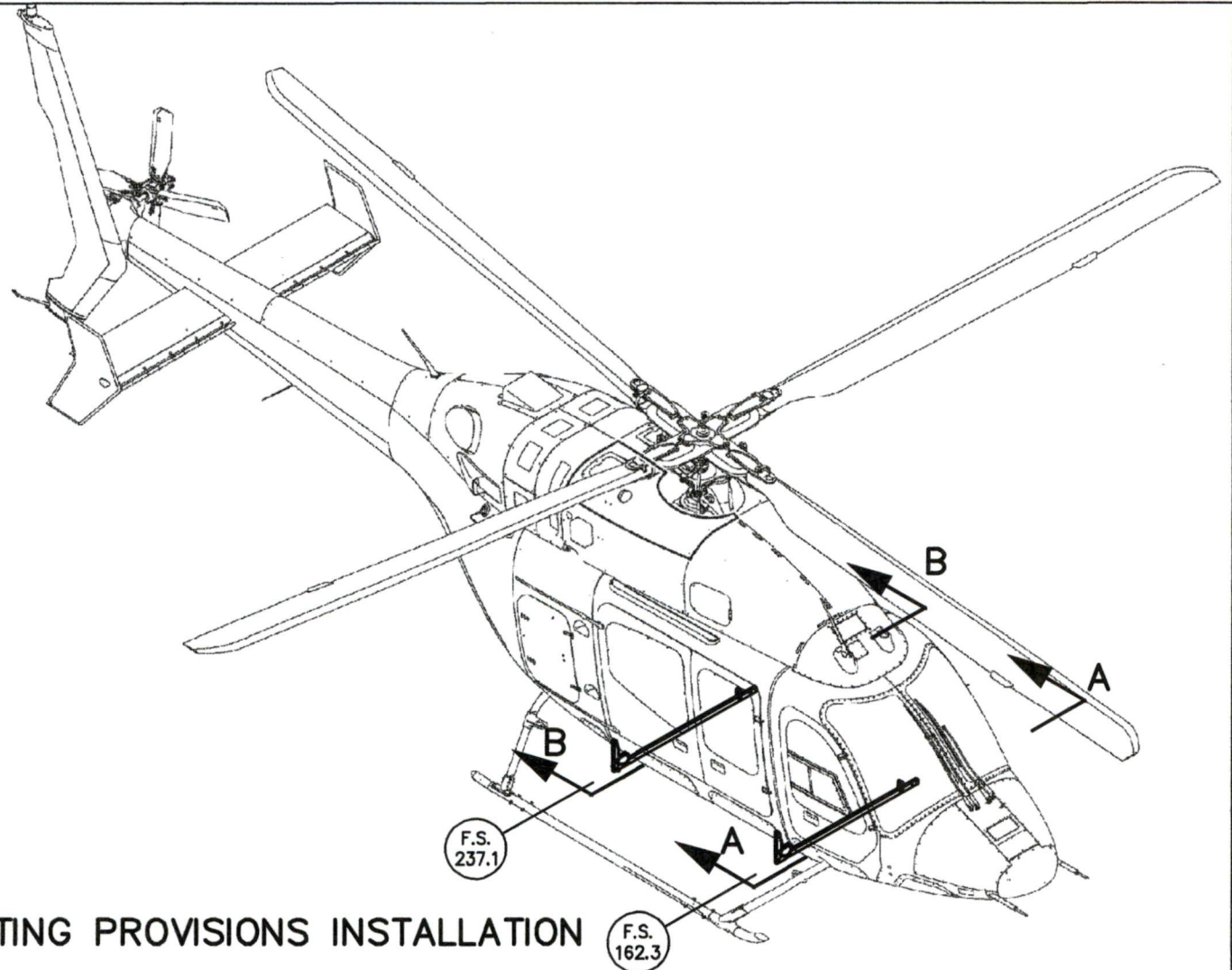


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BELL 429 - S/N 57081 & SUB.
QUICK RELEASE CARGO BASKET
CARGO BASKET INSTALLATION

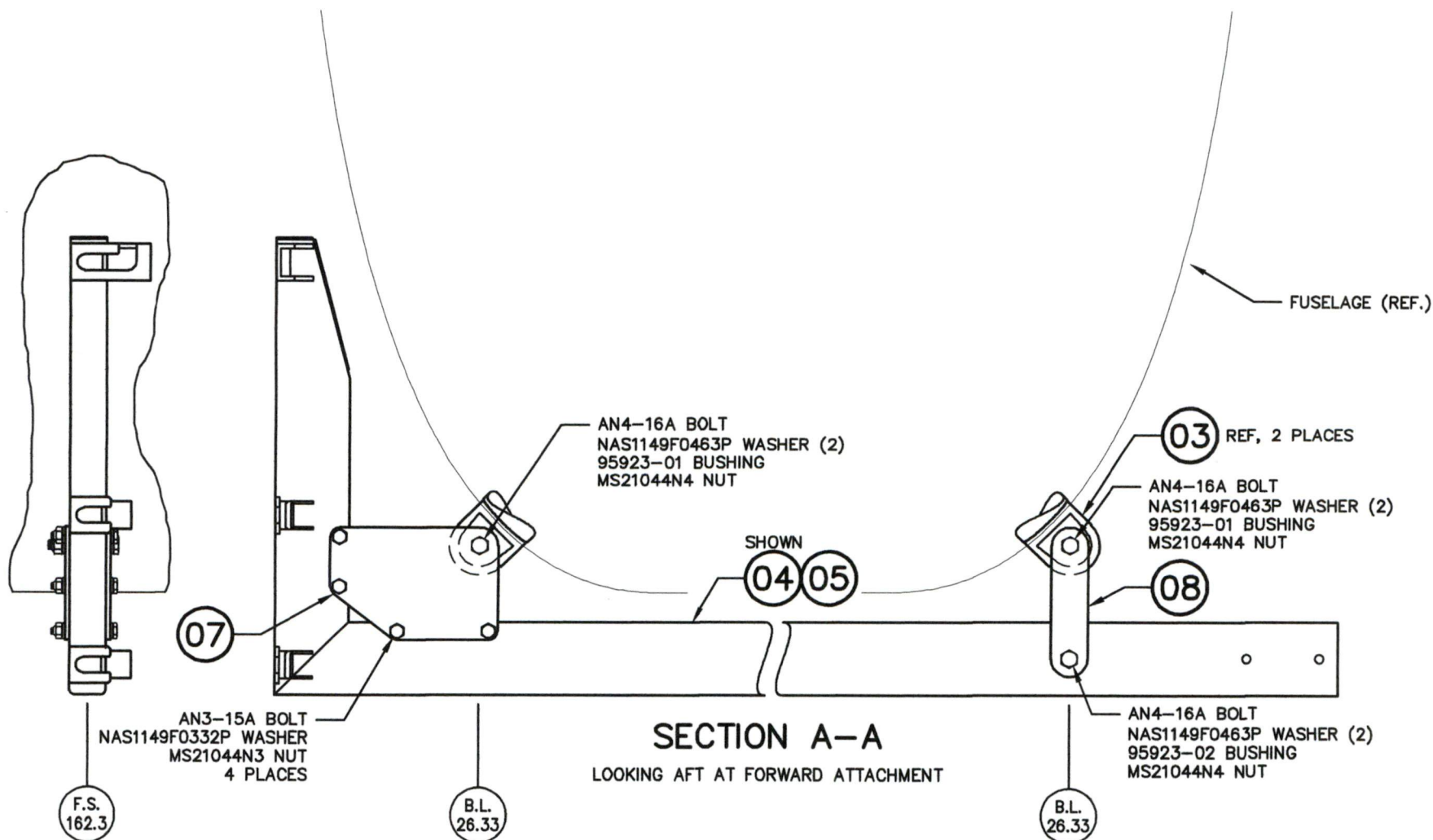
NOT TO SCALE	DWG. SIZE	DWG. NO.	REV.
SHEET 3 OF 3	A4	95905	0




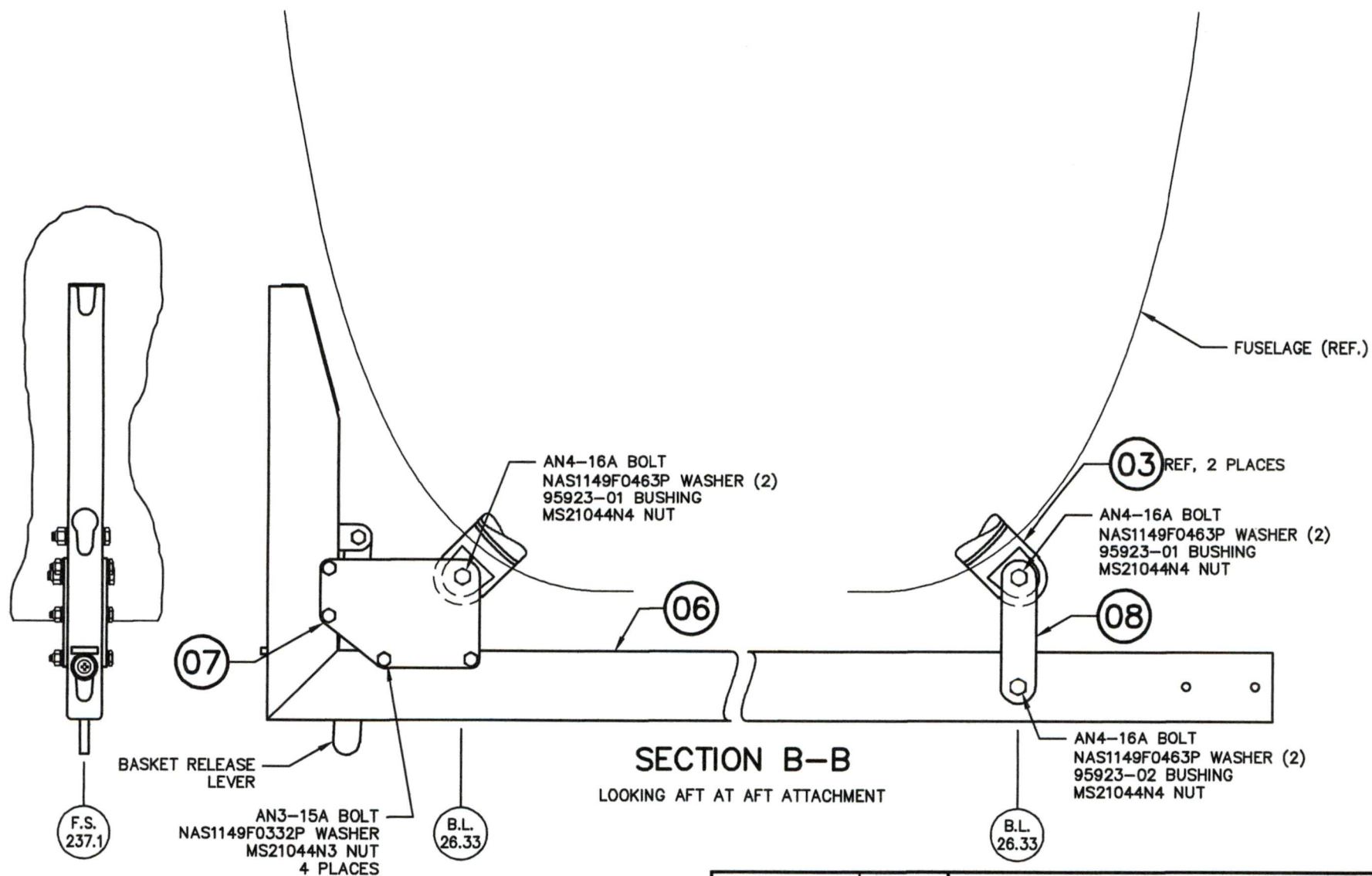
- ① RH MOUNTING PROVISIONS INSTALLATION
 ② LH MOUNTING PROVISIONS INSTALLATION

RIGHT HAND SHOWN, LEFT HAND OPPOSITE

APPROVALS		DATE		 <div>AERO DESIGN LTD. 9888A MALASPINA ROAD POWELL RIVER, BC, CANADA, V8A 0G3 TEL: 604.483.8876 www.aerodesign.ca</div>	
DRAWN: JEFF CLARKE		29 JAN 2014			
CHECKED: JASON REKVE					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2° X.XX ±0.03 X.X ±0.1				BELL 429 – S/N 57081 & SUB. QUICK RELEASE CARGO BASKET MOUNTING PROVISIONS INSTALLATION	
NOT TO SCALE		DWG. SIZE	DWG. NO.	REV.	
SHEET 1 OF 4		A4	95906	0	



APPROVALS		DATE			AERO DESIGN LTD. 9888A MALASPINA ROAD POWELL RIVER, BC, CANADA, V8A 0G8 TEL: 604.483.8876 www.aerodesign.ca		
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CHECKED: JASON REKVE							
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON:				BELL 429 - S/N 57081 & SUB. QUICK RELEASE CARGO BASKET MOUNTING PROVISIONS INSTALLATION			
DECIMALS		ANGLES					
X.XXX ±0.010		±1/2°					
X.XX ±0.03							
X.X ±0.1							
SCALE 1 : 4		DWG. SIZE		DWG. NO.		REV.	
SHEET 2 OF 4		A4		95906		0	



APPROVALS	DATE
DRAWN: JEFF CLARKE	29 JAN 2014
CHECKED: JASON REKVE	



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TOLERANCES ON:

DECIMALS	ANGLES
X.XXX ±0.010	±1/2°
X.XX ±0.03	
X.X ±0.1	

BELL 429 - S/N 57081 & SUB.
QUICK RELEASE CARGO BASKET
MOUNTING PROVISIONS INSTALLATION

SCALE 1 : 4
SHEET 3 OF 4

DWG. SIZE
A4

DWG. NO.
95906

REV.
0

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REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE	*	*

NOTES

- EXTERNAL ATTACHMENT PROVISIONS MUST BE INSTALLED IN ACCORDANCE WITH DRAWING 95907 PRIOR TO THIS INSTALLATION.
- TORQUE 3/16" FASTENERS TO 20-25 INCH-POUNDS (2.3-2.8 N-m).
TORQUE 1/4" FASTENERS TO 50-70 INCH-POUNDS (5.6-7.9 N-m).
- WEIGHT AND BALANCE GIVEN FOR RIGHT SIDE INSTALLATION.
LATERAL ARMS FOR LEFT SIDE ARE OPPOSITE.

WEIGHT AND BALANCE – METRIC

ITEM	DESCRIPTION	WEIGHT (kg)	LONGITUDINAL		LATERAL (NOTE 5)	
			ARM (mm)	MOMENT (mm-kg)	ARM (mm)	MOMENT (mm-kg)
03	EXTERNAL ATTACHMENT PROV.	1.22	5259.3	6441	0	0
04/05	FORWARD BEAM	6.62	4123.4	27307	70.9	469
06	AFT BEAM	6.62	6022.1	39881	77.0	510
07	PLATE (4)	0.18	5072.9	920	706.4	128
08	PLATE (4)	0.09	5072.9	460	-668.8	-60
01	RH PROVISIONS INST'N (TOTAL)	14.74	5088.3	75010	71.0	1046
02	LH PROVISIONS INST'N (TOTAL)	14.74	5088.3	75010	-71.0	-1046

WEIGHT AND BALANCE – STANDARD

ITEM	DESCRIPTION	WEIGHT (LB)	LONGITUDINAL		LATERAL (NOTE 5)	
			ARM (IN)	MOMENT (LB-IN)	ARM (IN)	MOMENT (LB-IN)
03	EXTERNAL ATTACHMENT PROV.	2.7	207.06	559.06	0	0
04/05	FORWARD BEAM	14.6	162.34	2370.16	2.79	40.73
06	AFT BEAM	14.6	237.09	3461.51	3.03	44.24
07	PLATE (4)	0.5	199.72	79.89	27.81	11.12
08	PLATE (4)	0.2	199.72	39.94	-26.33	-5.27
01	RH PROVISIONS INST'N (TOTAL)	32.5	200.33	6510.57	2.79	90.83
02	LH PROVISIONS INST'N (TOTAL)	32.5	200.33	6510.57	-2.79	-90.83

6	6	MS21044N4	NUT
12	12	NAS1149F0463P	WASHER
6	6	AN4-16A	BOLT
8	8	MS21044N3	NUT
16	16	NAS1149F0332P	WASHER
8	8	AN3-15A	BOLT
2	2	95923-02	10 BUSHING
4	4	95923-01	09 BUSHING
4	4	95942-02	08 PLATE
4	4	95942-01	07 PLATE
1	1	95933-01	06 AFT BEAM
1		95932-01-02	05 LH FORWARD BEAM
	1	95932-01-01	04 RH FORWARD BEAM
1	1	95907-01	03 EXTERNAL ATTACHMENT PROVISIONS INST.
		95906-01-02	02 LH MOUNTING PROVISIONS INSTALLATION
		95906-01-01	01 RH MOUNTING PROVISIONS INSTALLATION
QTY	QTY	PART NO.	ITEM DESCRIPTION
LIST OF MATERIALS			

APPROVALS		DATE
DRAWN:	JEFF CLARKE	29 JAN 2014
CHECKED:	JASON REKVE	

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DIMENSIONS ARE IN INCHES.
TOLERANCES ON:
DECIMALS ANGLES
X.XXX ±0.010 ±1/2"
X.XX ±0.03
X.X ±0.1

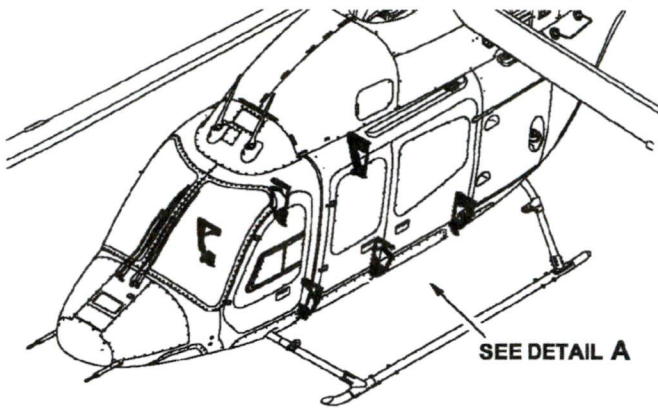


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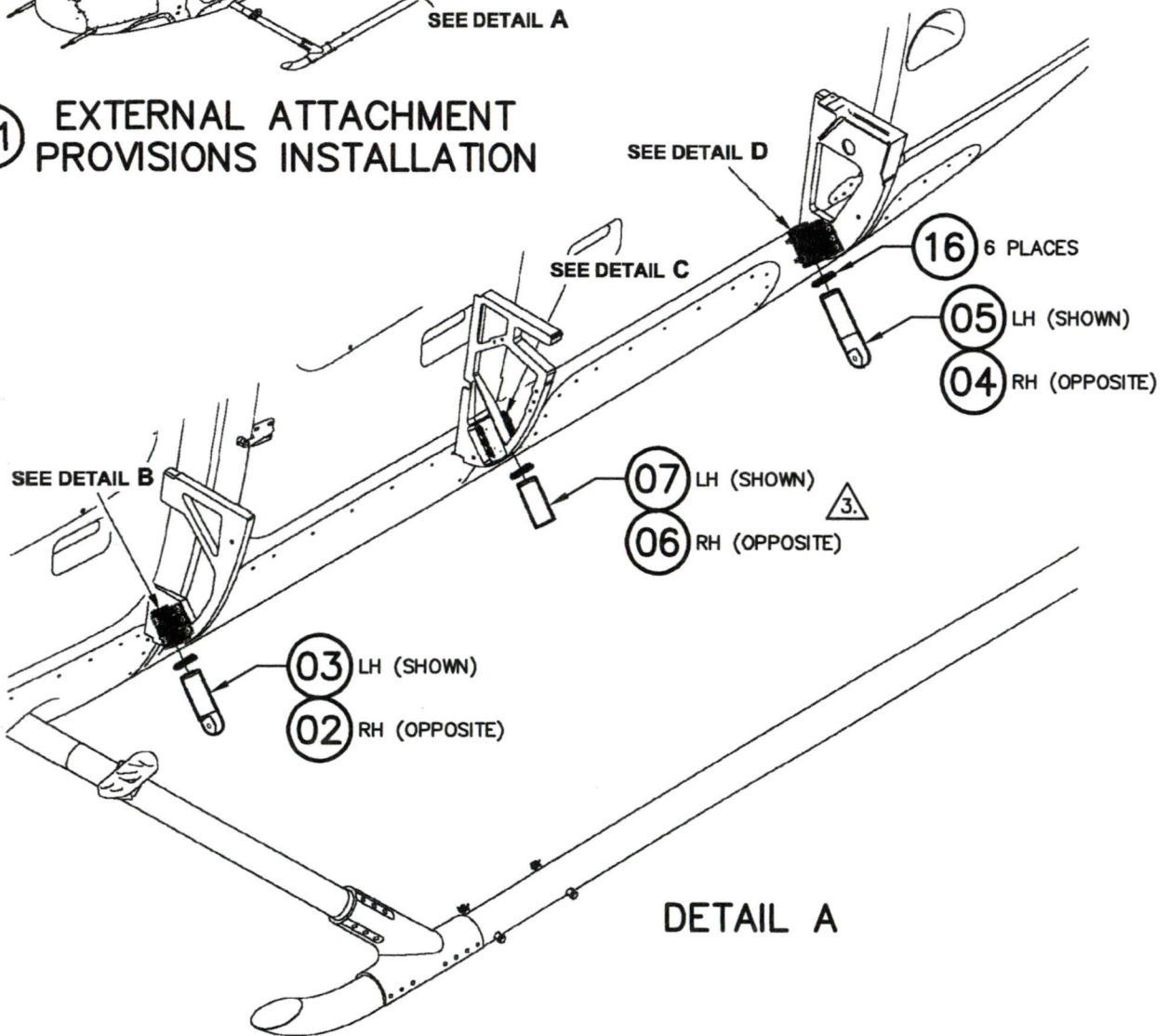
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BELL 429 – S/N 57081 & SUB.
QUICK RELEASE CARGO BASKET
MOUNTING PROVISIONS INSTALLATION

NOT TO SCALE	DWG. SIZE	DWG. NO.	REV.
SHEET 4 OF 4	A4	95906	0



01 EXTERNAL ATTACHMENT PROVISIONS INSTALLATION



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APPROVALS		DATE
DRAWN:	JEFF CLARKE	25 JAN 2014
CHECKED:	JASON REKVE	29 JAN 2014
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON:		
DECIMALS	ANGLES	
X.XXX ±0.010	±1/2°	
X.XX ±0.03		
X.X ±0.1		

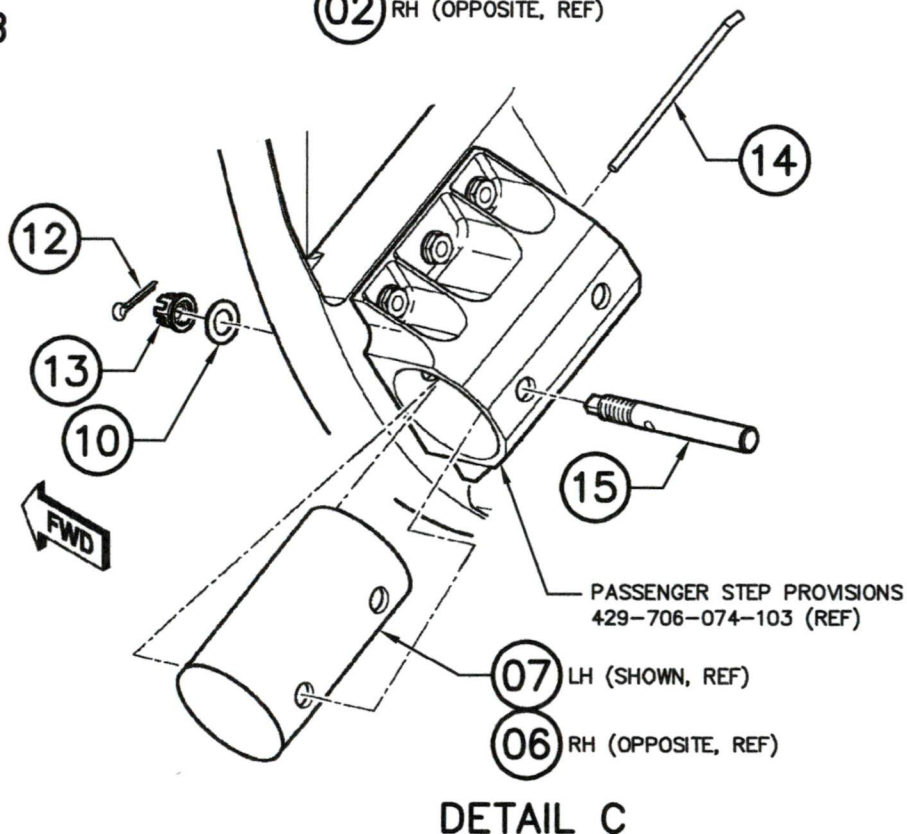
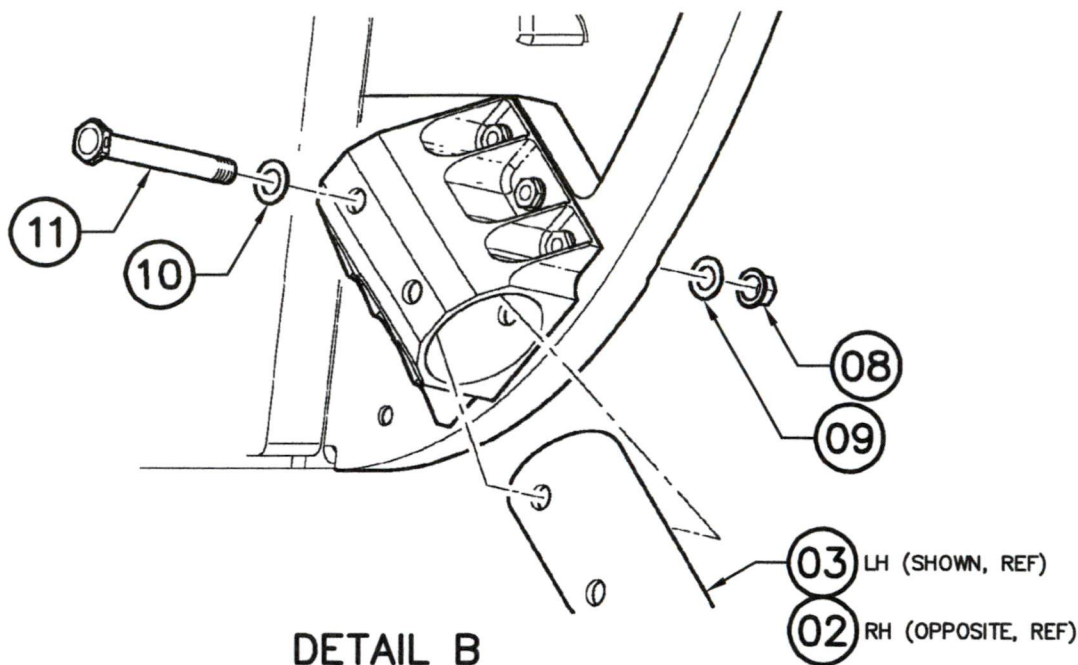


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9888A MALASPINA ROAD
POWELL RIVER, BC, CANADA, V8A 0G3
TEL: 604.483.2376 www.aerodesign.ca

BELL 429 - S/N 57081 & SUB.
QUICK RELEASE CARGO BASKET
EXTERNAL ATTACHMENT PROVISIONS INSTALLATION

SCALE 1 : 1	DWG. SIZE	DWG. NO.	REV.
SHEET 1 OF 4	A4	95907	0



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APPROVALS	DATE
DRAWN: JEFF CLARKE	25 JAN 2014
CHECKED: JASON REKVE	29 JAN 2014

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TOLERANCES ON:

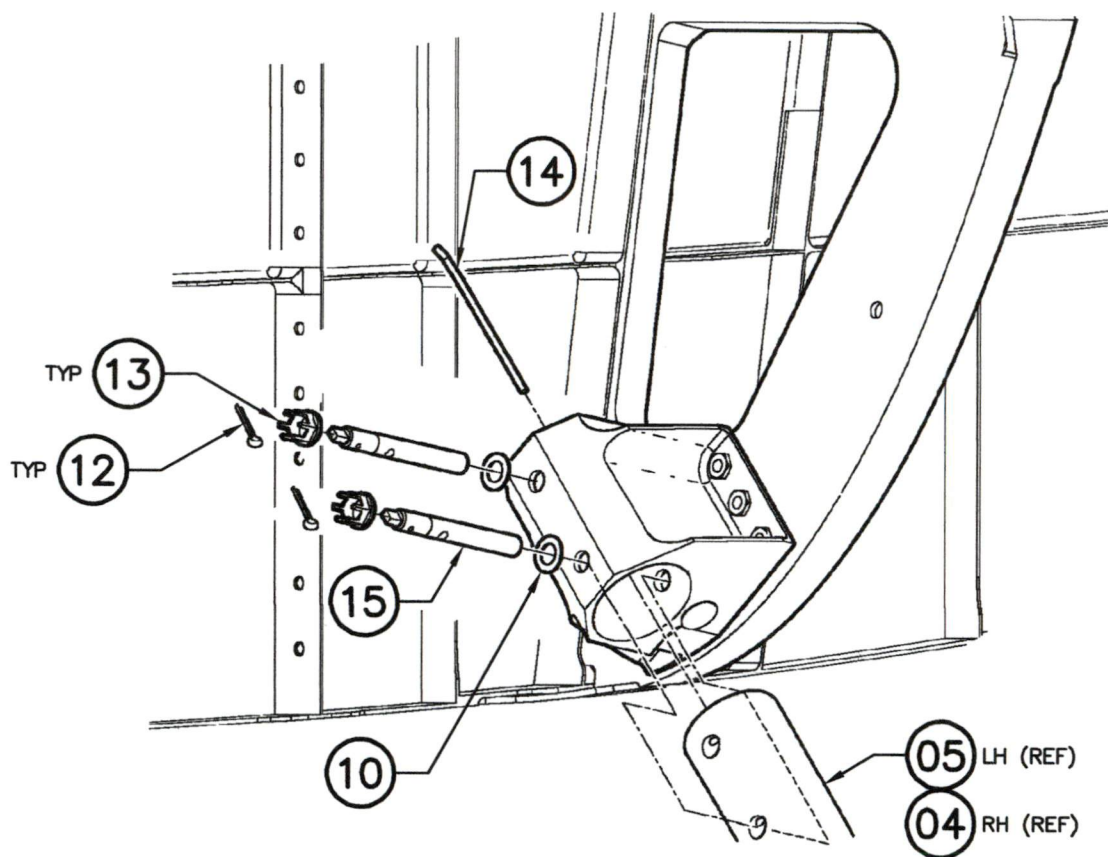
DECIMALS	ANGLES
X.XXX ± 0.010	$\pm 1/2^\circ$
X.XX ± 0.03	
X.X ± 0.1	

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BELL 429 - S/N 57081 & SUB.
QUICK RELEASE CARGO BASKET
EXTERNAL ATTACHMENT PROVISIONS INSTALLATION


SCALE 1 : 1	DWG. SIZE	DWG. NO.	REV.	
SHEET 2 OF 4	A4	95907	0	



DETAIL D

A/R	C-307	17	ADHESIVE	299-947-152 TYPE 1 CLASS 2		
6	120-205-2	16	SEAL	BELL HELICOPTER		
8	429-706-074-115	15	STUD	BELL HELICOPTER		
4	429-706-074-119	14	SHEAR PIN	BELL HELICOPTER		
8	MS14144L5	13	NUT			
8	MS24665-132	12	COTTER PIN			
4	NAS6605L32	11	BOLT			
12	NAS1149D0532J	10	WASHER			
4	NAS1149D0563J	09	WASHER			
4	MS21042L5	08	NUT			
1	95940-06	07	CENTRE LH PLUG			
1	95940-05	06	CENTRE RH PLUG			
1	95940-04	05	AFT LH LUG			
1	95940-03	04	AFT RH LUG			
1	95940-02	03	FORWARD LH LUG			
1	95940-01	02	FORWARD RH LUG			
1	95907-01	01	EXTERNAL ATTACHMENT PROVISIONS INSTALLATION			
01	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE

QTY LIST OF MATERIALS

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	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2° X.XX ±0.03 X.X ±0.1				
	BELL 429 - S/N 57081 & SUB. QUICK RELEASE CARGO BASKET EXTERNAL ATTACHMENT PROVISIONS INSTALLATION				
	SCALE 1 : 1 SHEET 3 OF 4	DWG. SIZE A4	DWG. NO. 95907	REV. 0	

REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		

NOTES

1. THIS INSTALLATION IS APPLICABLE TO BELL 429 S/N 57081 AND SUBSEQUENT.
FOR ATTACHMENT PROVISIONS INSTALLATION ON S/N 57080 AND PREVIOUS, REFER TO DRAWING 95902.
2. PASSENGER STEP PROVISIONS 429-706-074-103 (MID) AND 429-706-074-107 (FORWARD AND AFT)
MUST BE INSTALLED PRIOR TO THIS INSTALLATION.
3. CABIN STEP 429-030-136-101 AND -102 MUST BE REMOVED FROM BOTH SIDES PRIOR TO THIS INSTALLATION.
REFER TO MAINTENANCE MANUAL BHT-429-MM-1, SECTION 32-57. RETAIN HARDWARE FOR USE WITH THIS
INSTALLATION AS APPLICABLE. CENTRE POSITION IS NOT USED AND IS PLUGGED WITH ITEM 06/07.
4. TORQUE 5/16" FASTENERS TO 60-85 INCH-POUNDS (6.8-9.6 Nm).
5. REFER TO INSTRUCTIONS FOR CONTINUED AIRWORTHINESS ICA959.91 FOR DETAILED INSTALLATION INSTRUCTIONS.

WEIGHT AND BALANCE – METRIC

ITEM	DESCRIPTION	WEIGHT (kg)	LONGITUDINAL		LATERAL	
			ARM (mm)	MOMENT (mm-kg)	ARM (mm)	MOMENT (mm-kg)
06/07	CENTRE PLUG (RH/LH)	0.27	5113.0	1392	0.0	0.0
04/05	AFT LUG (RH/LH)	0.59	6024.9	3553	0.0	0.0
02/03	FORWARD LUG (RH/LH)	0.36	4125.0	1497	0.0	0.0
01	EXTERNAL ATTACHMENT PROVISIONS INSTALLATION (TOTAL)	1.22	5259.3	6441	0.0	0.0
	REMOVE EXISTING CABIN STEPS (429-030-136-101 / -102)	-4.99	5115.6	-25524	0.0	0.0

WEIGHT AND BALANCE – STANDARD

ITEM	DESCRIPTION	WEIGHT (LB)	LONGITUDINAL		LATERAL	
			ARM (IN)	MOMENT (LB-IN)	ARM (IN)	MOMENT (LB-IN)
06/07	CENTRE PLUG (RH/LH)	0.6	201.3	120.8	0.0	0.0
04/05	AFT LUG (RH/LH)	1.3	237.2	308.4	0.0	0.0
02/03	FORWARD LUG (RH/LH)	0.8	162.4	129.9	0.0	0.0
01	EXTERNAL ATTACHMENT PROVISIONS INSTALLATION (TOTAL)	2.7	207.1	559.1	0.0	0.0
	REMOVE EXISTING CABIN STEPS (429-030-136-101 / -102)	-11.0	201.4	-2215.4	0.0	0.0

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APPROVALS	DATE
DRAWN: JEFF CLARKE	25 JAN 2014
CHECKED: JASON REKVE	29 JAN 2014



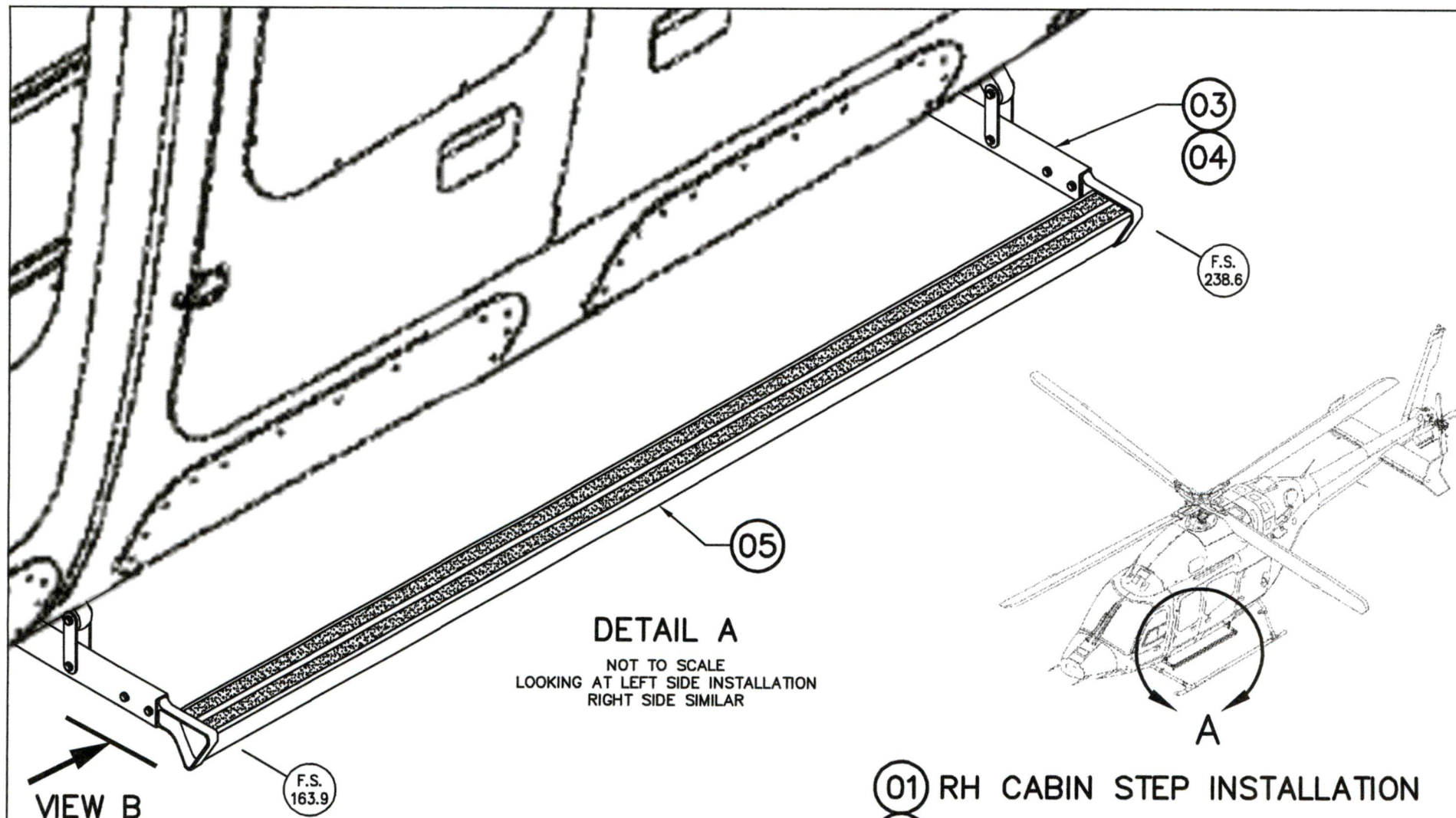
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TOLERANCES ON:
DECIMALS ANGLES
X.XXX ±0.010 ±1/2"
X.XX ±0.03
X.X ±0.1

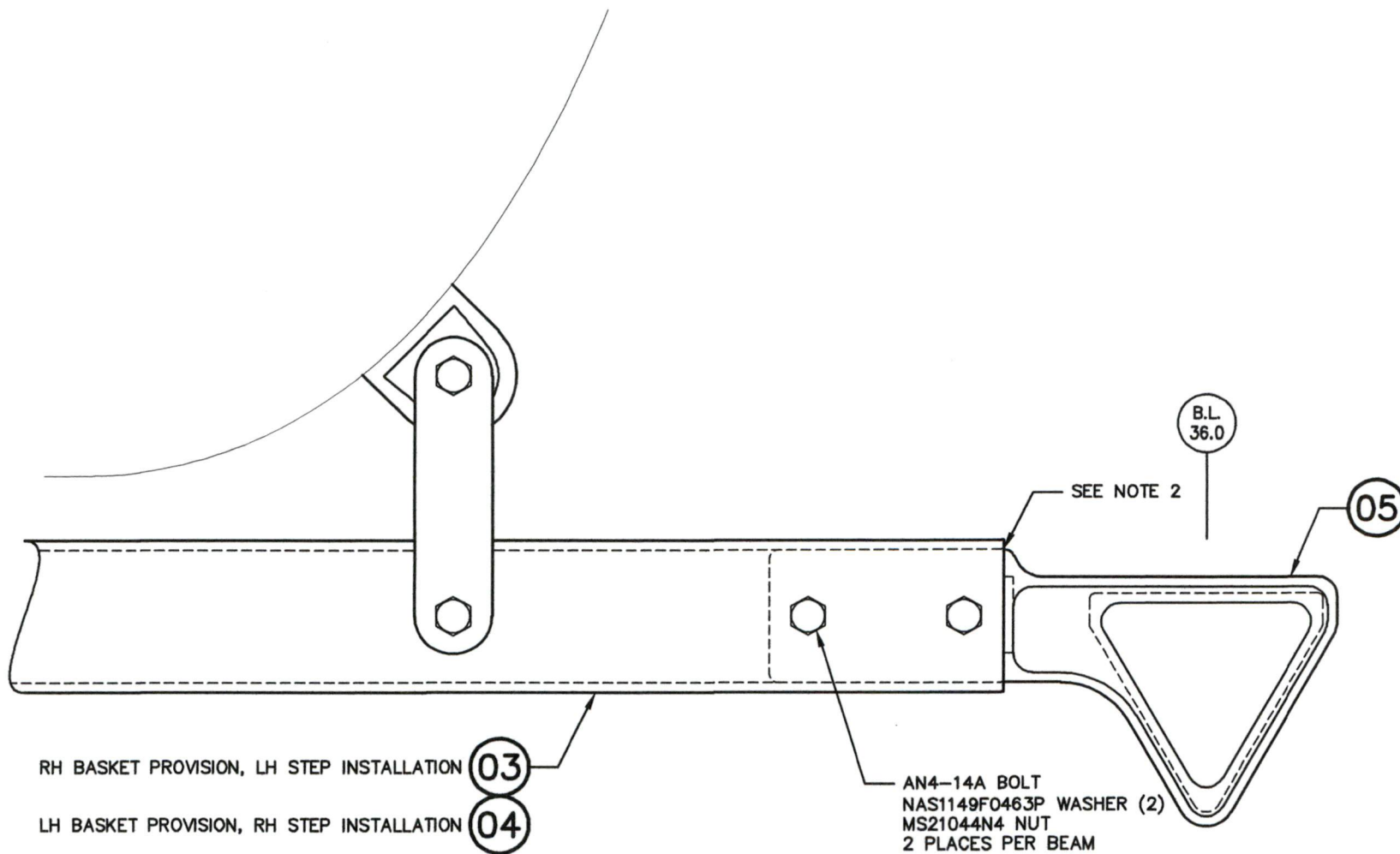
BELL 429 – S/N 57081 & SUB.
QUICK RELEASE CARGO BASKET
EXTERNAL ATTACHMENT PROVISIONS INSTALLATION

SCALE 1 : 1	DWG. SIZE	DWG. NO.	REV.
SHEET 4 OF 4	A4	95907	0




- (01) RH CABIN STEP INSTALLATION
 (02) LH CABIN STEP INSTALLATION
 LH SHOWN, RH OPPOSITE

APPROVALS		DATE		 AERO DESIGN LTD. 9888A MALASPINA ROAD POWELL RIVER, BC, CANADA, V8A 0G8 TEL: 604.489.2378 www.aerodesign.ca	
DRAWN: JEFF CLARKE		07 MAY 2014			
CHECKED: JASON REKVE					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2° X.XX ±0.03 X.X ±0.1				BELL 429 – S/N 57081 & SUB. CABIN STEPS FIXED CABIN STEP INSTALLATION	
NOT TO SCALE		DWG. SIZE	DWG. NO.	REV.	
SHEET 1 OF 3		A4	96905	0	



DETAIL B

SCALE 1 : 2
LOOKING AFT AT FORWARD ATTACHMENT
AFT ATTACHMENT SIMILAR

APPROVALS		DATE			AERO DESIGN LTD. 9888A MALASPINA ROAD POWELL RIVER, BC, CANADA, V8A 0G8 TEL: 604.489.8376 www.aerodesign.ca		
DRAWN: JEFF CLARKE		07 MAY 2014					
CHECKED: JASON REKVE							
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2" X.XX ±0.03 X.X ±0.1				BELL 429 – S/N 57081 & SUB. CABIN STEPS FIXED CABIN STEP INSTALLATION			
SCALE 1 : 2		DWG. SIZE		DWG. NO.		REV.	
SHEET 2 OF 3		A4		96905		0	

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REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE - CREATED FROM 95901, REV. 0		

NOTES

1. INSTALLATION OF MOUNTING PROVISIONS IN ACCORDANCE WITH DRAWING 95906 IS REQUIRED PRIOR TO THIS INSTALLATION.
2. APPLY SEALANT C-251 TO FAYING SURFACES OF STEP AND TUBE.
3. TORQUE AN4 BOLTS TO 30-40 IN-LBS (3.4-4.5 N-m).
4. REFER TO INSTRUCTIONS FOR CONTINUED AIRWORTHINESS ICA969.91 FOR MAINTENANCE INFORMATION.
5. WEIGHT AND BALANCE GIVEN FOR RIGHT SIDE STEP INSTALLATION, LATERAL ARMS FOR LEFT SIDE ARE OPPOSITE.

WEIGHT AND BALANCE - METRIC

ITEM	DESCRIPTION	WEIGHT (kg)	LONGITUDINAL ARM (mm)	MOMENT (mm-kg)	LATERAL (NOTE 5) ARM (mm)	MOMENT (mm-kg)
03/04	PROVISIONS INSTALLATION	14.7	5088.3	75010	-71.0	-1046
05	CABIN STEP ASSEMBLY	2.6	5073.7	13448	906.8	2386
01/02	FIXED CABIN STEP INSTALLATION	17.4	5086.6	88358	77.1	1340

WEIGHT AND BALANCE - STANDARD

ITEM	DESCRIPTION	WEIGHT (LB)	LONGITUDINAL ARM (IN)	MOMENT (LB-IN)	LATERAL (NOTE 4) ARM (IN)	MOMENT (LB-IN)
03/04	PROVISIONS INSTALLATION	32.5	200.33	6510.57	-2.79	-90.83
05	CABIN STEP ASSEMBLY	5.8	199.75	1158.55	35.70	207.06
01/02	FIXED CABIN STEP INSTALLATION	38.3	200.24	7669.12	3.03	116.23

A/R	A/R	C-251	SEALANT (BELL)
4	4	MS21044N4	NUT
8	8	NAS1149F0463P	WASHER
4	4	AN4-14A	BOLT
1	1	96910-01	05 CABIN STEP ASSEMBLY
	1	95906-01-02	04 LH MOUNTING PROVISIONS INSTALLATION
1		95906-01-01	03 RH MOUNTING PROVISIONS INSTALLATION
		96905-01-02	02 LH FIXED CABIN STEP INSTALLATION
		96905-01-01	01 RH FIXED CABIN STEP INSTALLATION
QTY	QTY	PART NO.	ITEM DESCRIPTION
			LIST OF MATERIALS

APPROVALS	DATE
DRAWN: JEFF CLARKE	07 MAY 2014
CHECKED: JASON REKVE	

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TOLERANCES ON:
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X.XXX ±0.010 ±1/2°
X.XX ±0.03
X.X ±0.1

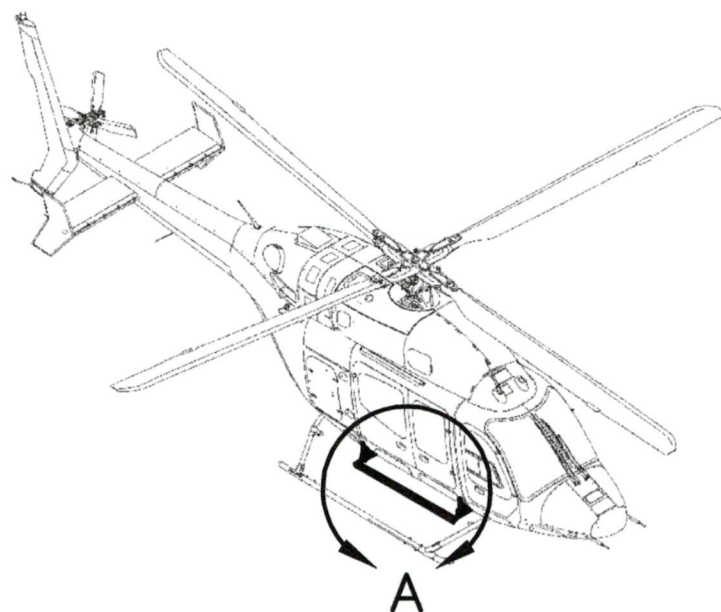


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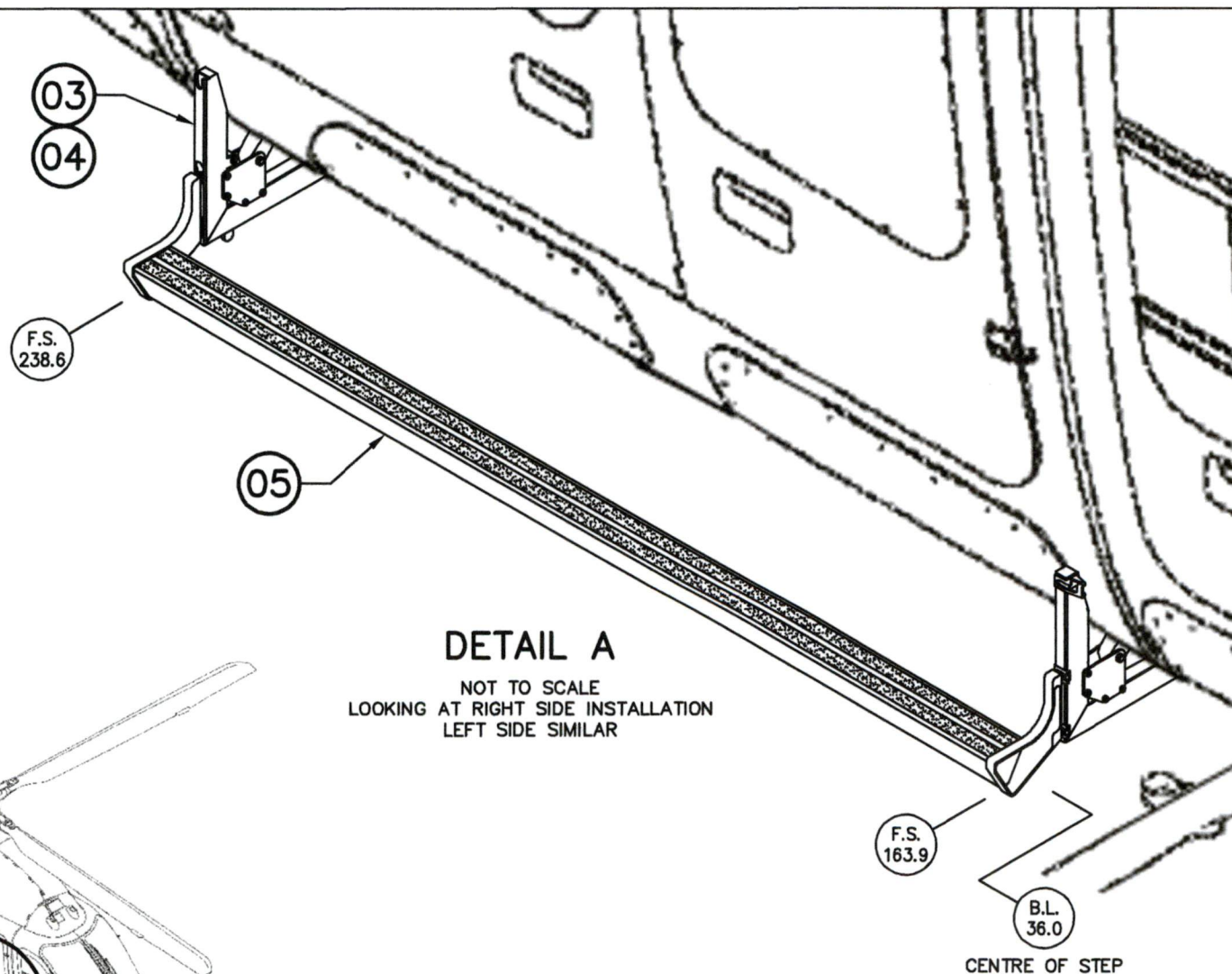
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POWELL RIVER, BC, CANADA, V8A 0G8
TEL: 604.488.8976 www.aerodesign.ca

BELL 429 - S/N 57081 & SUB.
CABIN STEPS
FIXED CABIN STEP INSTALLATION

NOT TO SCALE	DWG. SIZE	DWG. NO.	REV.
SHEET 3 OF 3	A4	96905	0




- (01) RH QUICK RELEASE CABIN STEP INST'N
 (02) LH QUICK RELEASE CABIN STEP INST'N
 RH SHOWN, LH OPPOSITE



DETAIL A

NOT TO SCALE
 LOOKING AT RIGHT SIDE INSTALLATION
 LEFT SIDE SIMILAR

APPROVALS		DATE			AERO DESIGN LTD. 9886A MALASPINA ROAD POWELL RIVER, BC, CANADA, V8A 0G8 TEL: 604.489.8376 www.aerodesign.ca	
DRAWN: JEFF CLARKE		07 MAY 2014				
CHECKED: JASON REKVE						
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2° X.XX ±0.03 X.X ±0.1				BELL 429 – S/N 57081 & SUB. CABIN STEPS QUICK RELEASE CABIN STEP INSTALLATION		
NOT TO SCALE		DWG. SIZE	DWG. NO.	REV.		
SHEET 1 OF 2		A4	96906	0		

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REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE - CREATED FROM 96902, REV. 0		

NOTES

1. INSTALLATION OF MOUNTING PROVISIONS IN ACCORDANCE WITH DRAWING 95906 IS REQUIRED PRIOR TO THIS INSTALLATION.
2. REFER TO FLIGHT MANUAL SUPPLEMENT FMS969.90 FOR FLIGHT LIMITATIONS AND INFORMATION.
3. REFER TO INSTRUCTIONS FOR CONTINUED AIRWORTHINESS ICA969.91 FOR MAINTENANCE INFORMATION.
4. WEIGHT AND BALANCE GIVEN FOR RIGHT SIDE, LATERAL ARMS FOR LEFT SIDE ARE NEGATIVE.

WEIGHT AND BALANCE - METRIC

ITEM	DESCRIPTION	WEIGHT (kg)	LONGITUDINAL		LATERAL (NOTE 4)	
			ARM (mm)	MOMENT (mm-kg)	ARM (mm)	MOMENT (mm-kg)
03/04	PROVISIONS INSTALLATION	14.7	5088.3	75010	71.0	1046
05	CABIN STEP ASSEMBLY	2.7	5073.7	13808	908.3	2472
01/02	QUICK RELEASE CABIN STEP INST'N	17.5	5086.0	88818	201.5	3518

WEIGHT AND BALANCE - STANDARD

ITEM	DESCRIPTION	WEIGHT (LB)	LONGITUDINAL		LATERAL (NOTE 4)	
			ARM (IN)	MOMENT (LB-IN)	ARM (IN)	MOMENT (LB-IN)
03/04	PROVISIONS INSTALLATION	32.5	200.33	6510.57	2.79	90.83
05	CABIN STEP ASSEMBLY	6.0	199.75	1198.50	35.76	214.56
01/02	QUICK RELEASE CABIN STEP INST'N	38.5	200.24	7709.07	7.93	305.39

1	1	96911-01	05	QUICK RELEASE STEP ASSEMBLY
1		95906-01-02	04	LH MOUNTING PROVISIONS INSTALLATION
	1	95906-01-01	03	RH MOUNTING PROVISIONS INSTALLATION
		96906-01-02	02	LH QUICK RELEASE CABIN STEP INSTALLATION
		96906-01-01	01	RH QUICK RELEASE CABIN STEP INSTALLATION
02	01	PART NO.	ITEM	DESCRIPTION
QTY	QTY	LIST OF MATERIALS		

APPROVALS	DATE
DRAWN: JEFF CLARKE	07 MAY 2014
CHECKED: JASON REKVE	

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TOLERANCES ON:
DECIMALS ANGLES
X.XXX ±0.010 ±1/2"
X.XX ±0.03
X.X ±0.1



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POWELL RIVER, BC, CANADA, V8A 0G8
TEL: 804.489.8376 www.aerodesign.ca

BELL 429 - S/N 57081 & SUB.

CABIN STEPS
QUICK RELEASE CABIN STEP INSTALLATION

NOT TO SCALE	DWG. SIZE	DWG. NO.	REV.
SHEET 2 OF 2	A4	96906	0



DECLARATION OF CONFORMITY WITH THE CERTIFICATION BASIS

In accordance with Canadian Aviation Regulations Subpart 521, I hereby declare that the design of the External Attachment Provisions and Cargo Basket Installation, as detailed in the data approved by Transport Canada on approval SH12-58, Issue 3, has been demonstrated to conform to the best of my knowledge to the basis of certification established by the Minister for that approval in file C-14-0212.

Aero Design Ltd.

per: _____

Signature

Jeff Clarke

Print Name

Vice President

Title

24 October 2014

Date

October 10, 2014

Mr. Jeff Clarke
Aero Design Ltd.
9888A Malaspina Road
Powell River, BC, Canada
V8A 0G3

Subject: Bell 429 R/H Cargo Basket 95905-01-01 Fit Check

Dear Mr. Clarke,

This letter is to confirm that Bell Helicopter Product Support Engineering witnessed the installation of the Bell 429 R/H cargo basket installation 95905-01-01 which included the following:

- R/H mounting provisions installation 95906-01-01;
- R/H cargo basket assembly 95950-01-01;
- External attachment provisions installation 95907-1;
- R/H quick release cabin step installation 96906-01-01
- L/H fixed cabin step installation 96905-01-01.

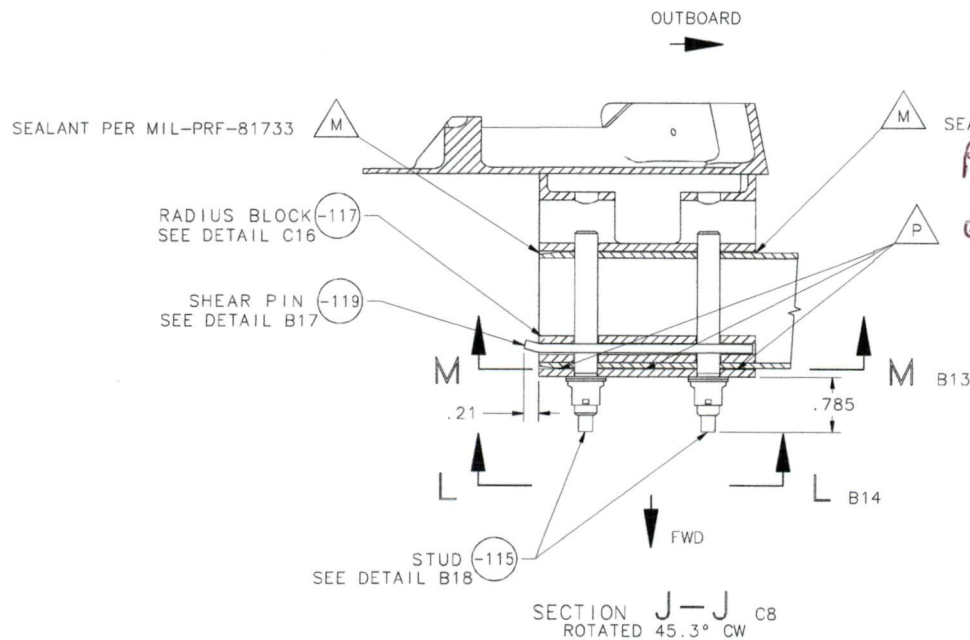
The fit check was carried out in accordance with document ICA 959.91 and a small clearance issue between the upper aft basket attachment and the aft beam (P/N 95933-01) upper keyway was noticed. No other issues were detected.

Despite the clearance issue, the exercise was considered successful. Aero Design Ltd is to perform a slight rework the aft beam keyway to correct the issue.

Best regards,


Sebastien Rousseau
Product Support Engineer

Product Support Engineering
12800 rue de l'Avenir, Mirabel, Quebec J7J 1R4
Tel: (450) 437-2077 Fax: (450) 433-0272
Tel : 1-800-463-3036
e-mail : pseinter@bh.com

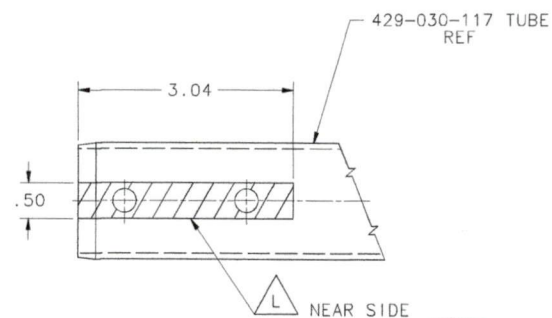
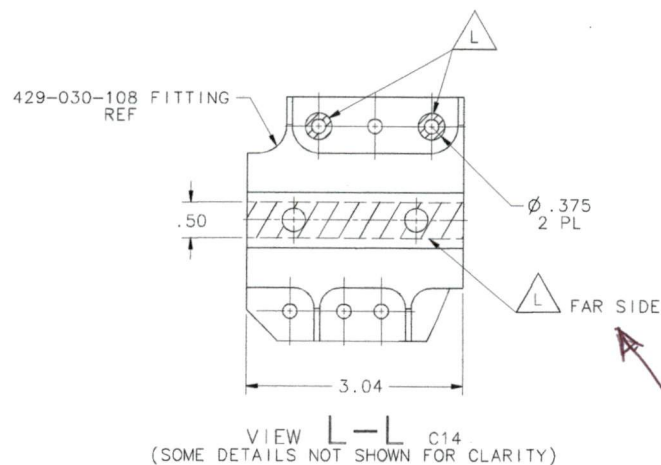
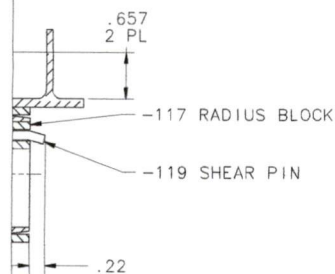


SEALANT PER MIL-PRF-81733

PROSEAL 870 class B

Electrically bond per BPS 4528 class S

AFT FITTING ONLY



⚠ No organic coating
or primer

Number	Title	Rev (current approved)	Rev Description of change (new)
DCL959-11	(Continued)		
36277	Handle Bar	✓ 0	1 TB
36278	Spring	✓ 2	3 TB
36280	Brace	✓ 2	3 TB
ER959.01	Engineering Report - Basket Installation	— 0	0 No change
ER959.02	Engineering Report - Load Test	— 0	0 No change
ER842.01	Engineering Report - Handle Assembly	— 0	0 No change
	Flight Test Report – Transport Canada	— --	-- No change
DCL959-12	Document Control List - Mounting Provisions Fabrication - S/N <57080	✓ 0	0 Changes below, new address
95920	Forward Fitting Fabrication	✓ 0	1 TB
95921	Aft Fitting Fabrication	✓ 0	1 TB
95922	Plates Fabrication	✓ 0	1 TB
95923	Bushing Fabrication	✓ 0	1 TB
95930	Forward Beam Fabrication	✓ 0	1 TB
95931	Aft Beam Fabrication	✓ 0	1 TB, bushing material corrected
DCL959-15	Document Control List - Basket Assembly - S/N 57081 and sub.	✓ --	0 New document
95950	Cargo Basket Assembly	✓ --	0 New drawing
95951	Basket Fabrication	✓ --	0 New drawing
95912	Lid Fabrication	✓ --	1 (above, DCL959-11)
95965	Basket Components - Forward Sheet	✓ --	0 New drawing
95916	Basket Components - Filler Sheet	✓ --	1 (above, DCL959-11)
95917	Basket Components - Lid Sheet	✓ --	1 (above, DCL959-11)
95964	Basket Components - Forward Attachment Hoop	✓ --	0 New drawing
95926	Basket Components - Aft Attachment Hoop	✓ --	1 (above, DCL959-11)
95927	Basket Components - Placard	✓ --	1 (above, DCL959-11)
94520	Basket Components - Hoop	✓ --	1 (above, DCL959-11)
49215	Basket Components - Spacer	✓ --	1 (above, DCL959-11)
49216	Basket Components - Spacer	✓ --	1 (above, DCL959-11)
84240	Lid Brace Installation	✓ --	0 New drawing
84255	Handle Assembly	✓ --	2 (above, DCL959-11)
84261	Handle Bar Assembly	✓ --	2 (above, DCL959-11)
84262	Handle Bracket Assembly	✓ --	2 (above, DCL959-11)
84263	Lid Handle Provisions Assembly	✓ --	0 New drawing - gives assembly a P/N, no changes
84265	Handle Lever	✓ --	2 (above, DCL959-11)
84267	Handle Bracket	✓ --	1 (above, DCL959-11)
84272	Bushing	✓ --	1 (above, DCL959-11)
36273	Lid Bracket	✓ --	2 (above, DCL959-11)
36274	Bushing	✓ --	3 (above, DCL959-11)
36275	Bushing	✓ --	4 (above, DCL959-11)

* Check basket weight * may change FCA/PMS/INST. DWGS.

Number	Title	Revision		Description of change
		(current approved)	(new)	
DCL959-15	(continued)			
36277	Handle Bar	✓ --		1 (above, DCL959-11)
36278	Spring	✓ --		3 (above, DCL959-11)
36280	Brace	✓ --		3 (above, DCL959-11)
ER959.01	Engineering Report - Basket Installation	✓ --		0 (above, DCL959-11)
ER959.02	Engineering Report - Load Test	✓ --		0 (above, DCL959-11)
ER842.01	Engineering Report - Handle Assembly	✓ --		0 (above, DCL959-11)
	Flight Test Report - Transport Canada	✓ --		-- (above, DCL959-11)
ER959.03	Engineering Report - S/N 57081 and sub. Configuration	✓ --		0 New document
TR959.04	Test Plan and Report - Attachment Fitting	✓ --		0 New document
TR959.05	Test Plan and Report - Lid and Forward Panels	✓ --		0 New document
DCL959-16	Document Control List - Mounting Provisions Fabrication	✓ --		0 New document
95940	Fittings Fabrication	✓ --		0 New drawing
95942	Plates Fabrication	✓ --		0 New drawing
95923	Bushing Fabrication	✓ --		1 (above, DCL959-12)
95932	Forward Beam Fabrication	✓ --		0 New drawing
95933	Aft Beam Fabrication	✓ --		0 New drawing
DCL969-1	Document Control List - Cabin Steps Installation		1	2 Add new configuration, new address
96901	Fixed Cabin Step Installation - S/N 57080 and prev.	✓ 0		1 TB
96902	Quick Release Cabin Step Installation - S/N 57080 and prev.	✓ 0		1 TB, remove alternate config., correct error in w&b
96905	Fixed Cabin Step Installation - S/N 57081 and sub.	✓ --		0 New drawing
96906	Quick Release Cabin Step Installation - S/N 57081 and sub.	✓ --		0 New drawing
FMS969.90	Flight Manual Supplement - Steps	✓ 1		2 Add new config., remove alt. config
ICA969.91	Instructions for Continued Airworthiness - Steps	✓ 0		1 Add new config, new address, remove alt. config.
DCL969-11	Document Control List - Cabin Steps Fabrication		0	1 Changes below, new address
96910	Fixed Step Assembly	✓ 0		1 TB, drain holes, finish note
96911	Quick Release Step Assembly	✓ 0		1 TB, drain holes, finish note
96920	Fixed Step Brackets	✓ 0		1 TB
96921	Quick Release Step Brackets	✓ 0		1 TB
80010	Quick Release Step Assembly (Alternate)	✓ 1		-- Removed - not required as alternate
80020	Quick Release Step Brackets	✓ 0		-- Removed - not required as alternate
ER969.01	Engineering Report	✓ 0		0 no change
DCL704-429	Document Control List - Modifications	✓ 0		1 Changes below, new address
70403	Auxiliary Latch Modification	✓ 4		5 TB, model list, P/Ns updated, tab (04) material, welc
70408	Installation, Hangar Wheel	✓ 0		1 TB, hardware, typo
70428	Assembly, Hangar Wheel	✓ 0		1 TB, hardware, subassembly removed
70438	Parts, Hangar Wheel	✓ 0		1 TB, chamfer, hole, anodizing

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

APPENDIX A-3 NORMAL CATEGORY ROTORCRAFT – CAR 527

BLOCK 1

Name of the applicant for the design change approval:	Aero Design Ltd.
Description of the design change:	Installation of Quick Release Cargo Baskets on Bell 429
Certification Basis of design change and revision date:	CAR 527, Change 527-9
CAR Standard A527.1(c) Program showing how changes to supplemental ICA made by the applicant or by the manufacturers of products and appliances installed in the aeroplane pursuant to the design change will be distributed:	Section 0-3 of Supplemental ICA (ICA 969.91)
CAR Standard 513.05 (1) (g) (iv): Installation Instructions:	Installation Drawing 96901, 96902, 96905, 96906

BLOCK 2

Note: Enter "N/A" when no supplemental ICA are needed.

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.2 (a) Manual(s) (a) The Instructions for Continued Airworthiness must be in the form of a manual or manuals as appropriate for the quantity of data to be provided.	ICA ref: Bell 429 Maintenance Manual, BHT-429-MM	Supplemental ICA ref: Single Manual (ICA969.91)
A527.2 (b) Practical arrangement (b) The format of the manual or manuals must provide for a practical arrangement.	ICA ref: Bell 429 Maintenance Manuals	Supplemental ICA ref: Arranged in ATA format
A527.3 The Instructions for Continued Airworthiness must contain the following manuals or sections, as appropriate, and information:		
A527.3 (a) Rotorcraft maintenance manual or section		
A527.3 (a) (1) (Introduction) (1) Introduction information that includes an explanation of the rotorcraft's features and data to the extent necessary for maintenance or preventive maintenance.	ICA ref: Bell 429 Maintenance Manual, Chapter 1	Supplemental ICA ref: Section 0-1
A527.3 (a) (2) (Description) (2) A description of the rotorcraft and its systems and installations including its engines, rotors, and appliances.	ICA ref: Bell 429 Maintenance Manual, Chapter 1	Supplemental ICA ref: Section 0-5

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.3 (a) (3) Control & Operation (3) Basic control and operation information describing how the rotorcraft components and systems are controlled and how they operate, including any special procedures and limitations that apply.	ICA ref: N/A	Supplemental ICA ref: N/A
A527.3 (a) (4) Servicing (4) Servicing information that covers details regarding servicing points, capacities of tanks, reservoirs, types of fluids to be used, pressures applicable to the various systems, location of access panels for inspection and servicing, locations of lubrication points, lubricants to be used, equipment required for servicing, tow instructions and limitations, mooring, jacking, and levelling information.	ICA ref: Bell 429 Maintenance Manual, Chapter 12	Supplemental ICA ref: N/A
A527.3 The Instructions for Continued Airworthiness must contain the following manuals or sections, as appropriate, and information:		
A527.3 (b) Maintenance Instructions.		
A527.3 (b) (1) Scheduling 1) Scheduling information for each part of the rotorcraft and its engines, auxiliary power units, rotors, accessories, instruments, and equipment that provides the recommended periods at which they should be cleaned, inspected, adjusted, tested, and lubricated, and the degree of inspection, the applicable wear tolerances, and work recommended at these periods. However, the applicant may refer to an accessory, instrument, or equipment manufacturer as the source of this information if the applicant shows that the item has an exceptionally high degree of complexity requiring specialized maintenance techniques, test equipment, or expertise. The recommended overhaul periods and necessary cross-references to the Airworthiness Limitations section of the manual must also be included. In addition, the applicant must include an inspection program that includes the frequency and extent of the inspections necessary to provide for the continued airworthiness of the rotorcraft.	ICA ref: Bell 429 Maintenance Manual, Chapter 5	Supplemental ICA ref: Section 5-1
A527.3 (b) (2) Troubleshooting (2) Troubleshooting information describing probable malfunctions, how to recognize those malfunctions, and the remedial action for those malfunctions.	ICA ref: N/A	Supplemental ICA ref: N/A

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.3 (b) (3) Removal/replacement (3) Information describing the order and method of removing and replacing products and parts with any necessary precautions to be taken.	ICA ref: Bell 429 Maintenance Manual, Chapter 25	Supplemental ICA ref: Section 32-1 thru 32-4
A527.3 (b) (4) General (4) Other general procedural instructions including procedures for system testing during ground running, symmetry checks, weighing and determining the center of gravity, lifting and shoring, and storage limitations.	ICA ref: Bell 429 Maintenance Manual, Chapter 7 and 8	Supplemental ICA ref: Section 32-6
A527.3 (c) Access (c) Diagrams of structural access plates and information needed to gain access for inspections when access plates are not provided.	ICA ref: N/A	Supplemental ICA ref: N/A
A527.3 (d) Special inspections (d) Details for the application of special inspection techniques including radiographic and ultrasonic testing where such processes are specified.	ICA ref: Bell 429 Maintenance Manual, Chapter 5	Supplemental ICA ref: Section 5-1
A527.3 (e) Protective treatment (e) Information needed to apply protective treatments to the structure after inspection.	ICA ref: Bell Standard Practices Manual BHT-ALL-SPM, Chapter 3	Supplemental ICA ref: Section 5-3
A527.3 (f) Fasteners, torque values, etc (f) All data relative to structural fasteners such as identification, discard recommendations, and torque values.	ICA ref: Bell Standard Practices Manual BHT-ALL-SPM, Chapter 2	Supplemental ICA ref: Section 32-7
A527.3 (g) Special tools (g) A list of special tools needed.	ICA ref: N/A	Supplemental ICA ref: N/A


MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

BLOCK 3

Note: The statement in block 5 does not constitute an approval of the Airworthiness Limitations Section. Airworthiness Limitations differ from other maintenance tasks, in that they are mandatory, as a direct condition of the approval of the type design. They are therefore referenced directly in the approval document itself. However, they must also be included in the Supplemental Instructions for Continued Airworthiness.

<p>A527.4 AWL - Separate Section 1</p> <p>The Instructions for Continued Airworthiness must contain a section titled Airworthiness Limitations that is segregated and clearly distinguishable from the rest of the document. This section must set forth each mandatory replacement time, structural inspection interval, and related structural inspection procedure approved under 527.571. If the Instructions for Continued Airworthiness consist of multiple documents, the section required by this paragraph must be included in the principal manual. This section must contain a legible statement in a prominent location that reads: "The Airworthiness Limitations section is approved by the Minister and specifies maintenance required by any applicable airworthiness or operating rule unless an alternative program has been approved by the Minister."</p>	<p>ICA ref: Bell 429 Maintenance Manual, Chapter 4</p>	<p>Supplemental ICA ref: Chapter 4</p>
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BLOCK 4 – Applicant Statement of Compliance

<p>The Supplemental ICA referenced above comprises the complete listing of supplemental ICA necessary to show compliance with the regulatory standard that supports this change in type design.</p>	
<p>Applicants Signature: </p>	<p>Date: 15 September 2014</p>
<p>Applicants Name: Jeff Clarke, Vice President</p>	

BLOCK 5 – Minister's Statement of Acceptability

<p>The design change is adequately supported by existing ICA and/or supplemental ICA, as identified above and is acceptable to the Minister.</p>			
<p>Reviewer's Name: _____</p>	<p>Phone # _____</p>	<p>Email: _____</p>	<p>Mail Routing Symbol: _____</p>
<p>Signature: _____</p>	<p>Date: _____</p>	<p>NAPA Number: _____</p>	

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

APPENDIX A-3 NORMAL CATEGORY ROTORCRAFT – CAR 527

BLOCK 1

Name of the applicant for the design change approval:	Aero Design Ltd.
Description of the design change:	Installation of Quick Release Cargo Baskets on Bell 429
Certification Basis of design change and revision date:	CAR 527, Change 527-9
CAR Standard A527.1(c) Program showing how changes to supplemental ICA made by the applicant or by the manufacturers of products and appliances installed in the aeroplane pursuant to the design change will be distributed:	Section 0-3 of Supplemental ICA (ICA 959.91)
CAR Standard 513.05 (1) (g) (iv): Installation Instructions:	Installation Drawing 95901, 95902, 95905, 95906, 95907

BLOCK 2

Note: Enter "N/A" when no supplemental ICA are needed.

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.2 (a) Manual(s) (a) The Instructions for Continued Airworthiness must be in the form of a manual or manuals as appropriate for the quantity of data to be provided.	ICA ref: Bell 429 Maintenance Manual, BHT-429-MM	Supplemental ICA ref: Single Manual (ICA959.91)
A527.2 (b) Practical arrangement (b) The format of the manual or manuals must provide for a practical arrangement.	ICA ref: Bell 429 Maintenance Manuals	Supplemental ICA ref: Arranged in ATA format
A527.3 The Instructions for Continued Airworthiness must contain the following manuals or sections, as appropriate, and information:		
A527.3 (a) Rotorcraft maintenance manual or section		
A527.3 (a) (1) (Introduction) (1) Introduction information that includes an explanation of the rotorcraft's features and data to the extent necessary for maintenance or preventive maintenance.	ICA ref: Bell 429 Maintenance Manual, Chapter 1	Supplemental ICA ref: Section 0-1
A527.3 (a) (2) (Description) (2) A description of the rotorcraft and its systems and installations including its engines, rotors, and appliances.	ICA ref: Bell 429 Maintenance Manual, Chapter 1	Supplemental ICA ref: Section 0-5, 0-6

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.3 (a) (3) Control & Operation (3) Basic control and operation information describing how the rotorcraft components and systems are controlled and how they operate, including any special procedures and limitations that apply.	ICA ref: N/A	Supplemental ICA ref: N/A
A527.3 (a) (4) Servicing (4) Servicing information that covers details regarding servicing points, capacities of tanks, reservoirs, types of fluids to be used, pressures applicable to the various systems, location of access panels for inspection and servicing, locations of lubrication points, lubricants to be used, equipment required for servicing, tow instructions and limitations, mooring, jacking, and levelling information.	ICA ref: Bell 429 Maintenance Manual, Chapter 12	Supplemental ICA ref: N/A
A527.3 The Instructions for Continued Airworthiness must contain the following manuals or sections, as appropriate, and information:		
A527.3 (b) Maintenance Instructions.		
A527.3 (b) (1) Scheduling 1) Scheduling information for each part of the rotorcraft and its engines, auxiliary power units, rotors, accessories, instruments, and equipment that provides the recommended periods at which they should be cleaned, inspected, adjusted, tested, and lubricated, and the degree of inspection, the applicable wear tolerances, and work recommended at these periods. However, the applicant may refer to an accessory, instrument, or equipment manufacturer as the source of this information if the applicant shows that the item has an exceptionally high degree of complexity requiring specialized maintenance techniques, test equipment, or expertise. The recommended overhaul periods and necessary cross-references to the Airworthiness Limitations section of the manual must also be included. In addition, the applicant must include an inspection program that includes the frequency and extent of the inspections necessary to provide for the continued airworthiness of the rotorcraft.	ICA ref: Bell 429 Maintenance Manual, Chapter 5	Supplemental ICA ref: Section 5-1
A527.3 (b) (2) Troubleshooting (2) Troubleshooting information describing probable malfunctions, how to recognize those malfunctions, and the remedial action for those malfunctions.	ICA ref: N/A	Supplemental ICA ref: N/A

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.3 (b) (3) Removal/replacement (3) Information describing the order and method of removing and replacing products and parts with any necessary precautions to be taken.	ICA ref: Bell 429 Maintenance Manual, Chapter 25	Supplemental ICA ref: Section 25-1 thru 25-12
A527.3 (b) (4) General (4) Other general procedural instructions including procedures for system testing during ground running, symmetry checks, weighing and determining the center of gravity, lifting and shoring, and storage limitations.	ICA ref: Bell 429 Maintenance Manual, Chapter 7 and 8	Supplemental ICA ref: Section 25-13
A527.3 (c) Access (c) Diagrams of structural access plates and information needed to gain access for inspections when access plates are not provided.	ICA ref: N/A	Supplemental ICA ref: N/A
A527.3 (d) Special inspections (d) Details for the application of special inspection techniques including radiographic and ultrasonic testing where such processes are specified.	ICA ref: Bell 429 Maintenance Manual, Chapter 5	Supplemental ICA ref: Section 5-1
A527.3 (e) Protective treatment (e) Information needed to apply protective treatments to the structure after inspection.	ICA ref: Bell Standard Practices Manual BHT-ALL-SPM, Chapter 3	Supplemental ICA ref: Section 5-3
A527.3 (f) Fasteners, torque values, etc (f) All data relative to structural fasteners such as identification, discard recommendations, and torque values.	ICA ref: Bell Standard Practices Manual BHT-ALL-SPM, Chapter 2	Supplemental ICA ref: Section 25-14
A527.3 (g) Special tools (g) A list of special tools needed.	ICA ref: N/A	Supplemental ICA ref: N/A

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

BLOCK 3

Note: The statement in block 5 does not constitute an approval of the Airworthiness Limitations Section. Airworthiness Limitations differ from other maintenance tasks, in that they are mandatory, as a direct condition of the approval of the type design. They are therefore referenced directly in the approval document itself. However, they must also be included in the Supplemental Instructions for Continued Airworthiness.

A527.4 AWL - Separate Section 1 The Instructions for Continued Airworthiness must contain a section titled Airworthiness Limitations that is segregated and clearly distinguishable from the rest of the document. This section must set forth each mandatory replacement time, structural inspection interval, and related structural inspection procedure approved under <u>527.571</u> . If the Instructions for Continued Airworthiness consist of multiple documents, the section required by this paragraph must be included in the principal manual. This section must contain a legible statement in a prominent location that reads: "The Airworthiness Limitations section is approved by the Minister and specifies maintenance required by any applicable airworthiness or operating rule unless an alternative program has been approved by the Minister."	ICA ref: Bell 429 Maintenance Manual, Chapter 4	Supplemental ICA ref: Chapter 4
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BLOCK 4 – Applicant Statement of Compliance

The Supplemental ICA referenced above comprises the complete listing of supplemental ICA necessary to show compliance with the regulatory standard that supports this change in type design.

Applicants Signature: Jeff Clarke Date: 15 September 2014

Applicants Name: Jeff Clarke, Vice President

BLOCK 5 – Minister's Statement of Acceptability

The design change is adequately supported by existing ICA and/or supplemental ICA, as identified above and is acceptable to the Minister.

Reviewer's Name: _____ Phone # _____ Email: _____ Mail Routing Symbol: _____

Signature: _____ Date: _____ NAPA Number: _____

CONFORMITY INSPECTION RECORD

Applicant Aero Design Ltd.	Aeronautical Product				Title of Change Cargo Basket Installation (959 Configuration)
	Make	Model	Serial No.	Registration	
	Bell	429			
Drawing No. 95950, Rev. 0	Applicant's Inspector Signature _____ Date _____		T.C. Inspection Signature _____ Date _____		Findings
95950-01-02 (LH Basket)	* SEE NOTE JH CCL 05/09/2014				
95950-01-01 (RH Basket)	JH CCL 05/09/2014				

APPLICANT'S ATTESTATION

I hereby confirm that the prototype installation for the subject

☒ MODIFICATION,

☐ REPAIR,

☐ TSO/AP-TC ARTICLE

is in conformity with the applicable installation drawing(s) listed above
and that necessary ground tests have been carried out.
[Please check (✓) the applicable box.]

Additional Information:

✂ 95950-01-02 LH Basket does not have forward end sheet installed on the basket body. This detail is non-conforming, but the basket assembly is still a representative structure for the lid load tests.

Signature: JH CCL

TC INSPECTION

☐ ACCEPTABLE

☐ UNACCEPTABLE

Remarks:

Signature: _____

CONFORMITY INSPECTION RECORD

Applicant Aero Design Ltd.	Aeronautical Product				Title of Change Cargo Basket Installation (959 Configuration)
	Make	Model	Serial No.	Registration	
	Bell	429			
Drawing No. 95940, Rev. 0 95940-04 LH Aft Fitting	Applicant's Inspector Signature _____ Date _____		T.C. Inspection Signature _____ Date _____		Findings
			05/09/2014		

APPLICANT'S ATTESTATION

I hereby confirm that the prototype installation for the subject

- ☒ MODIFICATION,
☐ REPAIR,
☐ TSO/AP-TC ARTICLE

is in conformity with the applicable installation drawing(s) listed above
and that necessary ground tests have been carried out.
[Please check (✓) the applicable box.]

Additional Information:

Signature:

TC INSPECTION

- ☐ ACCEPTABLE
☐ UNACCEPTABLE

Remarks:

Signature: _____

5.0 TEST RESULTS

Test witnessed by TCCA DAZ JAMES TINSON
5.1 Limit Load #304

Condition	Required Load	Actual Load	Witness Initial
Limit Maneuvering	1180 lbs	1197 lbs	JL 5 Sept 2014
Limit Drag	166 lbs	170 lbs	

(pictures)

5.2 Ultimate Load

Condition	Required Load	Actual Load	Witness Initial
Ultimate Maneuvering	1769 lbs	1828 lbs	JL 5 Sept 2014
Ultimate Drag	249 lbs	280 lbs	

(pictures)

Minor scuffing on anodized surfaces
 Part to be measured by ADL
 No signs of deformation

5.3 Findings / Comments

5.0 TEST RESULTS

Tests witnessed by TCCA DAR JAMES TINSO.V

5.1 Air Loads - Lid Panel**5.1.1 Limit Load**

Condition	Required Load	Actual Load	Witness Initial
Limit Drag (upward)	360 lbs (distributed)	375	<i>[Signature]</i> 5 Sept 2014

(pictures)

5.1.2 Ultimate Load

Condition	Required Load	Actual Load	Witness Initial
Ultimate Drag (upward)	541 lbs (distributed)	550	<i>[Signature]</i>

(pictures)

*Loaded ✓***5.2 Personnel Loads - Lid Panel****5.2.1 Ultimate Load**

Condition	Required Load	Actual Load	Witness Initial
Ultimate Personnel (downward)	400 lbs (concentrated)	400 lbs	<i>[Signature]</i>

(pictures)

5.3 Air Loads - Forward Panel~~Test witnessed by TCCA DAB JAMES TINSON~~**5.3.1 Limit Load**

Condition	Required Load	Actual Load	Witness Initial
Limit Drag (aft)	246 lbs (distributed)		

(pictures)

5.3.2 Ultimate Load

Condition	Required Load	Actual Load	Witness Initial
Ultimate Drag (aft)	368 lbs (distributed)	375 lbs	JL

(pictures)

no deflection

5.4 Findings / Comments

Technical Data Request

Bell Helicopter Request No.

S/W 57081 + Sub.

Part Name

Passenger Step

Date

August 29, 2014

	<u>English</u>	<u>Metric</u>
Weight	pounds (lb)	Kg
Arm	inches (in)	mm
Moment	inch.pounds (in.lb)	mm.kg

Lateral Calculations.

- = Left

+ = Right

	Model	Kit	Weight	Longitudinal		Lateral	
				Arm	Moment	Arm	Moment
	429	429-030-136-101					
English			5.5	201.4	1108	-33.6	-185
Metric			2.5	5116	12762	-853	-2129

	429	429-030-136-102					
English			5.5	201.4	1108	33.6	185
Metric			2.5	5116	12762	853	2129

Note

This is the Delta Wt effect of this kit.

Includes the weight & effect of the items removed when this kit is installed.

<u>Completed by</u> Mark Burge Tel. (450) 971-6500 ext 2892 Weights Dept (BHTC),	<u>Note:</u>
---	--------------

Technical Data Request

Bell Helicopter Request No.

S/N 57001- 57080

Part Name

Passenger Step

Date

August 29, 2014

	<u>English</u>	<u>Metric</u>
Weight	pounds (lb)	Kg
Arm	inches (in)	mm
Moment	inch.pounds (in.lb)	mm.kg

Lateral Calculations.

- = Left

+ = Right

	Model	Kit	Weight	Longitudinal		Lateral	
				Arm	Moment	Arm	Moment
	429	429-030-080-107					
English			7.4	201.5	1491	-33.4	-247
Metric			3.4	5118	17180	-848	-2848
	429	429-030-080-108					
English			7.4	201.5	1491	33.4	247
Metric			3.4	5118	17180	848	2848

Note

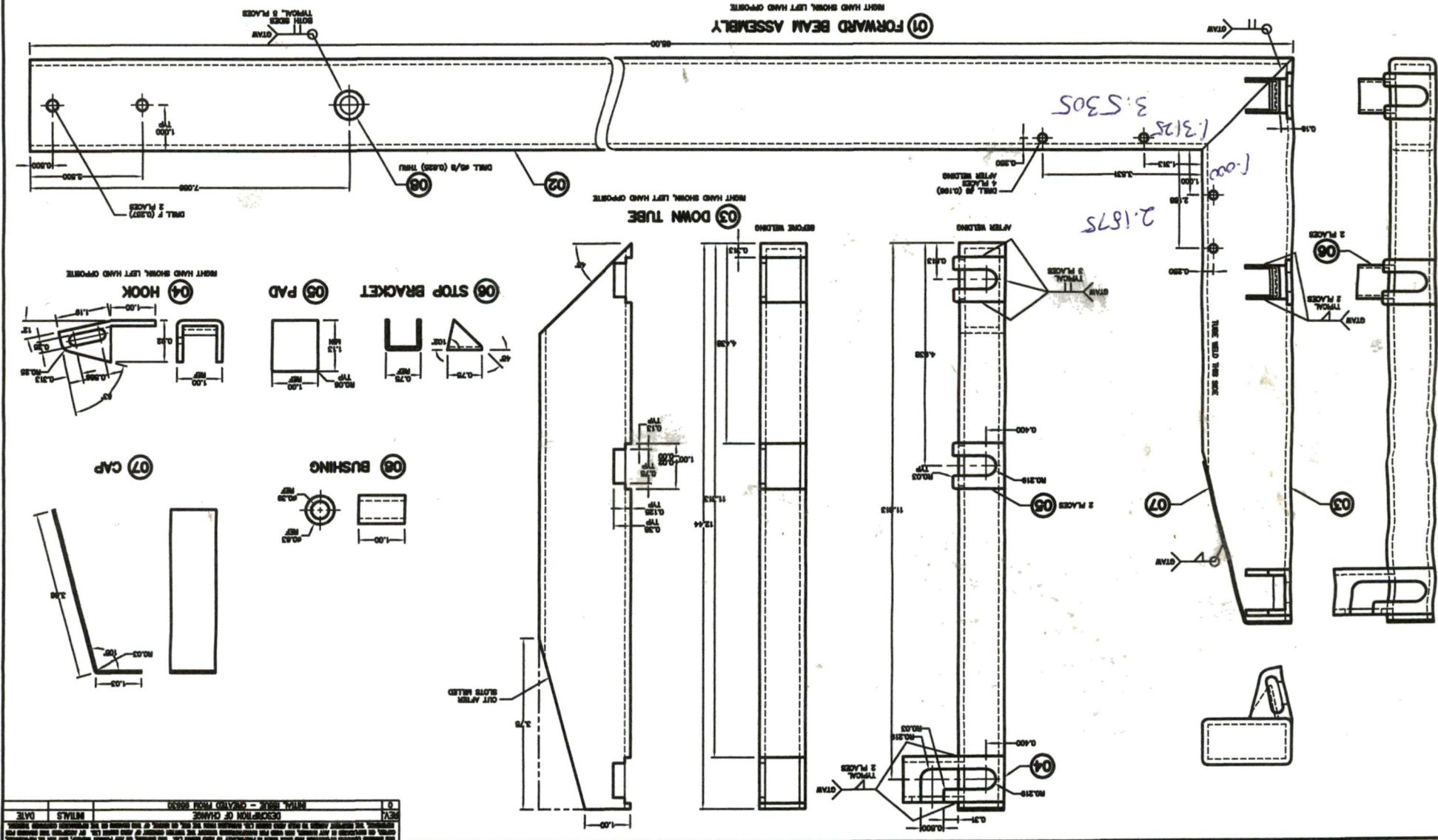
This is the Delta Wt effect of this kit.

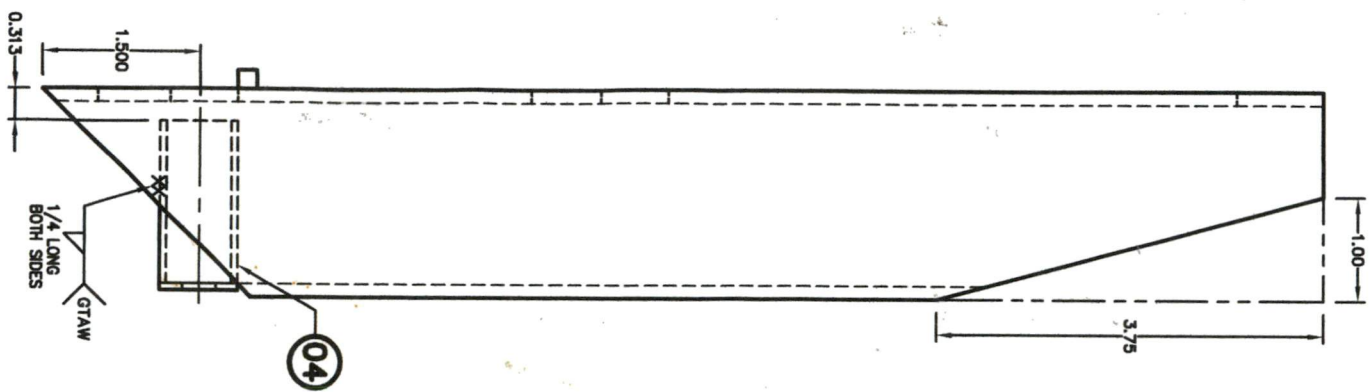
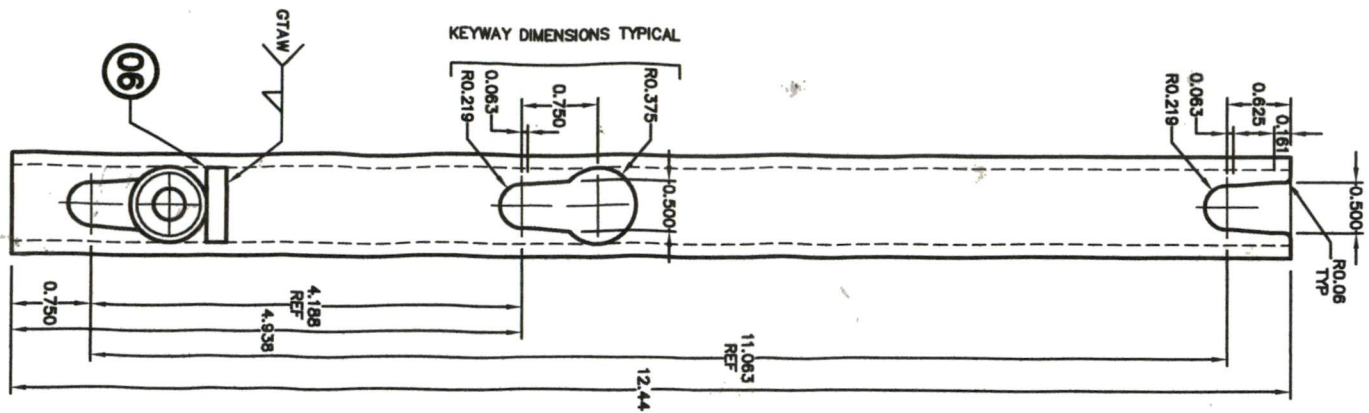
Includes the weight & effect of the items removed when this kit is installed.

<u>Completed by</u> Mark Burge Tel. (450) 971-6500 ext 2892 Weights Dept (BHTC),	<u>Note:</u>
---	--------------

[illegible]

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.
2. HEATING OF JOG STRAIGHTEN STEEL TO BE COMPLETED BY STRAY METHOD TO ADEQUAC.
3. HEATING AND SHALL CONFORM TO SPEC. OR EQUIVALENT.
3. THROUGHOUT, DEGREASE AND POWDER COAT ALL STEEL PARTS PRIOR TO ASSEMBLY.





03 DOWN TUBE

ER959.03_0draft1_2014.04.02_DAR.Comments_WPN1402
Wing Engineering Limited Project Number: 1402

DAR 304's comments wrt ER959.03_0draft1.pdf and {ER959.03_0draft2.pdf}
Aero Design comments c/w Bell Report 800267910, 6 June 2014 in Dark Yellow
2014.06.06_JClark-JTinson_Updated.Reports.pdf
ER959.03_0draft3.pdf
TR959.04_0draft3.pdf
TR959.05_0draft3.pdf
DAR 304's comments, 13 Jun 2014 in Brown

Engineering Report, ER959.03
Bell 429, Quick Release Cargo Basket
{Please add a title; "DESIGN LOADS" or something similar} Done
S/N 67081 & Sub. Configuration {Corrected to 57081, Aero Design to recheck all docs.} Done
DRAFT
Revision 0, 14 March 2014, 16 Pages
By: Jeff Clarke, P.Tech.(Eng.)
Aero Design Ltd

Cover Page
As above.
Okay

ToC Page
Okay

Page 3

1.0 Introduction

Include "delta" type comments wrt the original ER. Done {Okay}
i.e.; copy a the important comments from the delta project description.
{The compliance/cert plan demonstrates the compliance with the BOC.
I believe that this report to establish the ultimate design loads for the test plans
noted? or ???}. Please update to suit.} This is a certification report for all aspects of
the project, it just happens to be mostly loads. Updated.
Okay ✓

2.0 Reference Text

Include document rev/date, titles, descriptions and "delta" type notes. Done {Okay}
[Don't include Ref Text - These are DAR's ref/check notes]

Engineering Reports;

{Move ER842.01 to the top of the list and please supply me with a copy.}
Done
Okay ✓

Should include references to;
TR959.04, 0, 14 Mar 14, Attachment Fitting Load Test

WRT TR959.04_0draft3 Where is Bell's acceptance that the
airframe fittings can resolve these test loads? Still awaiting
Bell Received, sent

Okay ✓

Are you making the 05/04 type Pins? Yes

Installed with tapered pins? No, NAS6605 bolts (fwd) and
Bell 5/16 stud (17-4 CRES precip hardened to 155-175 ksi)

For test will be grade 8 5/16" bolts as indicated

Instructions wrt installing the tapered pins?

Round all test values to the nearest pound. Done

{Okay above}

TR959.05, 0, 14 Mar 14, Carbon Fibre Aluminum Panel Load Tests.

[BTW, Does the ICA include any special inspection notes wrt the
Carbon Fibre components?] Yes {Please provide a draft copy.} draft
coming

WRT TR959.05 & this report are there any life-time knock-down
factors applicable to carbon fibre parts?

i.e.; analysis and testing to include a 1.X factor? Yes, 1.5

{As noted at the bottom of page 5;

CAR 527.619 Variability factor applied to carbon fibre
components $n_{vf} = 1.5$

vs. "CAR 527.619 Special Factors, (3) Subject to
appreciable variability due to:" uncertainties in
manufacturing or inspection.

This is an important and valid consideration.

I was thinking more about (2) "Likely to deteriorate in
service..." n-service factor knock down or nkd

Can you please provide reference to the publication/s for
your 1.5 variability value and a 1.0 deterioration value? [I've
accepted a 1.7 factor for a synthetic rope after 10 years of
service. I would expect your factor to be lower.] Removed

Okay

This panel is "more" structural than I originally believed.
i.e.; it seems to be more than the "rain shield" that I
described to TCCA.

Please provide photos drawing of top side of the lid.

i.e.; the panel loads are transferred to the lid's steel tubes.

Photos / drawing emailed. {Thanks and I've seen the drawing
and lay-up SI.}

No composite lid going to use aluminum ✓

Please update description. ✓

Updated drawings????

95950
95951 - no changes.
95952, 95956, 95957

ER959.01, Rev 0, 6 Sept 12, Quick Release Cargo Basket

Compliance Report, Approved by; DAR 290M

Delta Info; no change to construction or loads? Done {Good}

Ref Text

Reports; ER959.02 - Load Test

Drawings;

95910, 0, Cargo Basket Assy, See item 8, 95916-01, Fwd Sheet
95911, 0, Basket Fabrication, 4130 GTAW
95912, 0, Basket Lid Assy, 4130 GTAW
95920, 0, Fwd Fitting Fab [Billet Machined Part]
95921, 0, Aft Fitting Fab [Billet Machined Part]
95930, 0, Fwd Beam Fab, 304SS GTAW
95931, 0, Aft Beam Fab, 304SS GTAW

ER959.02 Rev 0, 6 Sept 12, Quick Release Cargo Basket
Load Test Report, Approved by; DAR 290M Done {Good}
Ref Text
Reports; ER959.01 - Compliance
Drawings; 95910, 95911, 95912, 95930, 95931
As above.

Installation Drawings; {As reviewed drafts & with DAR added info noted.}

95905 - Need a copy emailed {0draft_QR.Cargo.Basket.Install_LH-RH }
95906 - Need a copy emailed {0draft_QR.Basket.LH-RH.Mnt.Provisions}
95907 - Need a copy emailed {0draft_QR.Attach.(Pin).Install}

Fabrication Drawings; {As reviewed drafts & with DAR added info noted.}

95912 ~~95962~~ - Need a copy emailed {I can't find this file} typo.

95932 - Need a copy emailed {0DRAFT_QR.Beam.Fwd.Fab}

95933 - Need a copy emailed {0S1DRAFT_QR.Beam.Aft.Fab &
0S2DRAFT_QR.Beam.Aft.Fab}

95940 referenced in TR959.04 - Need a copy emailed
{0draft_QR.Lugs.Fab}

95950 - Need a copy emailed {0DRAFT_QR.Basket.Assy}

95951 - Need a copy emailed {0draft_QR.Basket.Fab}

~~{95952_0draft_QR.Lid.Assy.(Fab), This looks more like a fabrication
drawing?}~~ Removed - back to 95912

~~{95964_0draft_QR.Fwd.Attach.Hoop.(Fab)}~~

~~{95965_0DRAFT_QR.Fwd.Sht.(Carbon.Layup_SI959.95-0)}~~

Changed to 5052 aluminum ✓

Please provide drawing. ✓

~~{95966_0S1DRAFT_QR.Filler.Sht.(Carbon.Layup_SI959.95-0)}~~ Removed
Okay ✓

~~{95967_0draft_QR.Lid.Sht.(Carbon.Layup_SI959.95-0)}~~ Removed
Okay ✓

~~{SI959.95_0draft_QR.Carbon.Layup.Procedures}~~ Removed
Okay ✓

~~{SI Review:~~

~~Title; Carbon/Kevlar/Glass Composite Panel Layup Procedures~~

~~After the Reference Text section add an Attachments section and~~

~~include the product guides and the data sheets that were originally
noted in the Ref Text section. i.e.; is this all of the required info for the
fabricator?~~

~~Would it help to reference the applicable Bell SPM sections?~~

~~Because you should consider/address:~~

~~• Safety procedures/requirements/protection etc..~~

- ~~Post cure inspection requirements.~~
- ~~Shop Q/A requirements and procedures.~~
 - ~~Mold/plate inspection should be at the start of each procedure.~~
 - ~~Material care and storage.~~
 - ~~Material control and sign-out requirements.~~
 - ~~Shop traveller sheets.~~
 - ~~etc.~~
- ~~This must be a TC approved composite shop?~~
- ~~?~~

~~Make a Required Tooling section and include the mold numbers~~
~~Please supply the mold drawings.~~
~~I believe that they should be included in the MDL.~~
~~Hand tools per the SPM?~~

3.0 BoC

Okay {Not okay. BOC should not be buried in this loads type document.}
 {If shown this should be referenced back to the fundamental BOC requirements noted in the Cert Plan where the BOC is approved/accepted by TCCA. i.e.; Please add the BOC to the Cert Plan.
 Please remove the "This report demonstrates...." note.} Done

4.0 Applicability of ADs

Similar note included in the original ER959.01_0 (?) This was a requirement from Calgary/Edmonton TC office, we were required to have it in the report since at least 2001 when I started, it was not in the project description up front.
 Okay
 {Not okay. An AD search/statement should not be buried in this loads type document. Please put it in the Cert Plan for TC acceptance.} Done

Page 4

5.0 Loads

Okay

Page 5

5.1 Inertia Loads

Okay

5.2 Drag Loads

Most other DARs cannot approve non-published load values.
 Include "no change" or "delta" comments. Done {Good. Is there an updated CP available?} Done

Page 6

5.2 Drag Loads continued

368 lbf in the aft direction [vs. 1532 lbf up from the lid.] Lid load changed
 {Some big changes! [for the better]
 Can you please provide at least one space between the values and the units?

i.e.; 1021lbf = 1021 lbf}

I use MathCad for my calculations. I tried to put in more spaces but it wouldn't take. The best I could do is have it put a dot in between. Hope that is more legible, advise if not.

Okay ✓

5.3 Lid Loads [vs. ER959.01_0 5.3 Attachment Fitting Loads]

This is new (Yes for change)

Please up-date;

CP959-1_0 527.301 Loads - Air Drag Loads for FOC by DOT. Done

{Good. Is there an updated CP available?} Done

Please provide a copy of the CP. ✓

How does the CP numbering work? Version - Revision???

Because the last approved CP was CP959 Rev 2 and the current CP is CP959-1 [Rev 0 ???]

I did not continue the previous CP959 Rev.2 (CP959_2) to Rev 3 because I wanted a clear distinction between the new configuration and old, so went to CP959-1.

{Very good.}

Show units in the required equations units. i.e.; Done {Thanks.}

Area Axx = XX in² = YY ft²

Velocity Vxx = XX knots = YY fps

etc.

"continuous (non-perforated) sheet" section not "solid"

or a better description and please include the "delta" change info. Done

is the drag vertical (down wash) or some combination? Up and down, climb and descent

5.3.1 Cargo

must support this "distributed" load. Done

{Page 8.

5.5.1, Last sentence change to read "The composite ~~carbon fiber~~ lid will be tested to structural demonstrate compliance."} Done, changed to Aluminum

{P cargo = 300 lbs x 1 g x 1.5 FoS = 450 lbs

~~P test = 450 lbs x 1.5 nvf x 1.5 nkd = XXX lbs~~} Done

5.3.2 Airflow

Where is the info showing that auto-rotation is higher than the best rate of climb? wrt weights, performance, angles, combined loading, up/dwn directions?

There are vert & horz vectors wrt both climb & auto-rotation.

i.e.; qualify this "most conservative" applied vertical load on the lid. Done

Page 7

5.3.2 Airflow continued

Again show equation type units. Done

{Page 9. Vmax_roc = 4350 ft/min = 43 knots = 72.5 ft/s}

{Page 10. Vmax_desc = 6000 ft/min = 59.2 knots = 100 ft/s}

{and again 811lbf = 811 lbf} Done

1532 lbf ult up for "auto-rotation" drag vs. 563 lbf ult up for -1.5g ult inertia???? Changed to vertical speeds {Okay}

{Page 10 5.5.3 Personnel}

{P person ult = 200 lbs x 2 g = 400 lbs over 6" x 12" footprint

~~P test = 400 lgs lbs x 1.5 nvf x 1.X nkd = XXX lbs }over footprint~~

Done

5.4 Attachment Fitting Loads

The attachment beam design resolves the Basket Loads into fwd-aft, side & vertical loads at the basket side fitting and vertical only (?) at the opposite side???

The basket side uses plates that can transfer all of the fwd-aft, side, and vertical loads (but no moment) to the airframe, the opposite side is a linkage arrangement that cannot transfer a lateral load or moment, so only vertical and fwd-aft can be carried at that point. {Okay}

Please show/id as x, y & z vectors per the convention for this aircraft on a 2D - 4 (front views of fwd & aft beams) view free body diagram (FBD) with reference Sta's, BL's & WL's. Done

Load Location Assumptions

WRT EC959.01_0.pdf;

a) What happened to the standard width basket option?

b) What happened to the short basket option?

The original proposal to Bell was to use our existing B407 baskets (3 different sizes) with no changes to the basket assembly and to allow any of them to be used. As it turned out, the 96" option made the most sense but required modification from the B407 configuration so none of the B407 baskets can be used.

Page 8

Figure 5.4.1 - Load Locations

[Load and Reaction Locations, BLs only.]

Why does the LHS of the Fwd/Aft Beams extend so far out the opposite side? Step mnts? Yes, and steps are mandatory.

This is one of the required 4 2D views. Done

[527.807 Emergency Exits

Noted in CP959-1_0 as "No" Change from CP Rev. 2 and "N/A, Installation does not block doors."

Same note was included in the last CP959_2.pdf, REV. No. 2 22]

Please include door opening info where if the doors can be obstructed by a deformed the Basket and there should be a note about the generous ground clearance.

Do the doors have any emergency exit provisions?

If so please provide copies of the applicable Bell document pages and include some comments in the ER.

[I have noted that a lot of the above info was included in earlier reports and it would to good to note this "per report 959-XX" type references.]

Added this to the report in Section 7.0, emailed IPB for mod kit.
{Okay.}

Aft Support Beam Reactions

Vertical Wts $(75 + 300) * 3.5 * 1.5 = 1969 \text{ lbf}$ vs. **Lid @ 1532 lbf** Changed

The FBDs will help show what's happening.

~~Please include shear and moment diagrams for each beam.~~ N/A

~~Where is the combined loading; aft drag plus vertical g load?~~ Combined per Load testing

Page 9

Aft Support Beam Reactions continued

Assumes????

Aren't these exact calculations?

[40/60 is a more typical assumption.]

Point taken, number used is at CofG of beam {Okay}

Forward Support Beam Reactions

Where is the combined loading; aft drag plus vertical g load or??? Done, aft beam is critical. {Okay}

Page 10

Forward Support Beam Reactions continued

Assumes????

Aren't these exact calculations?

Number used is at CofG of beam {Okay, Did my own calc.}

Drag Load

Support Beam Reactions

Assuming the basket is rigid how is the loading shared equally?

Description inserted: The basket is rigid (does not deform or twist between attachments with the drag load applied), and the mounting beams can deflect sufficiently without yielding (0.13 inches) to allow the basket attachments to bottom-out in the horizontal keyways, therefore the drag load is shared equally between the front and rear mounting beams.

are there washers or shims for a close fit? No {Okay}

diagram? Done {Okay}

2-D FBD's???? Done {Okay}

Page 11

6.0 Structural Compliance

6.1 Cargo Basket

By test. Refer to ER959.02

Are these aft horz + dwn vert = combined load tests? YES
Original tests completed with the lid open!

Lid by test. Refer to TR959.05
dwn vert drag? YES

Static load tests pending.

Is the step test a hard requirement via general design??

Better wording?? Not a hard requirement, prudent check for something that may occur in service. Changed wording in load section.

Brief Review of TR959.05_0draft1.pdf
2.0 Reference Text

Include document rev/date, titles, descriptions and "delta" type notes. Done

6.2 Mounting Beams

By test. Refer to ER959.02

Are these aft horz + dwn vert = combined load tests? YES

Original tests completed with scrap beam sections. No, conforming parts

What are the load sharing details???

i.e.; what are the design features???

{Page 16.

6.2.2 Air Flow Load Condition

Why discuss the Lid down force of 313 lbs vs. the 1960 lbs test load? It was to show the mounting beams had been demonstrated to support the new load, even though it was less than maneuvering load. Removed.

~~The 811 lb value does not include the 1.5 nvf factor.~~ It does in the limit load, which then carries into ultimate.

You have corrected the P drag_limit calc? Yes.

~~You have 811 lbs up vs. tested values of 560 lbs up and 1960 lbs dwn.~~

~~Can you make a symmetry assessment of the beam structure??~~

6.3 Attachment Fittings

By test. Refer to TR959.04

Are these aft horz + dwn vert = combined load tests? YES

6.4 Helicopter Attachment Points

Data from Bell

Are these aft horz + dwn vert = combined load tests? Yes

Please note and comment on the Bell numbers and the actual numbers used in this report and that these actual numbers are used for TR959.05/4 ✓

i.e.; we should see the same numbers here as in TR959.05/4 ✓

Please include references to where the loads and reactions can be found in this report. i.e.; a quick summary to match up Bell and TR959.05/4 ✓

{Page 16. 6.5? Composite Lid
Lid test plans and values??} Addressed in section 6.1

Page 12
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Page 13
Appendix A
Title and balance of page Blank? [Email from Bell](#)

Page 14
Blank [Email from Bell](#)

Page 15
Appendix B
Title and balance of page Blank? [May not be needed](#) Fuselage attachments report from
[Bell](#)

Page 16
Blank [Report from Bell](#)
[Thanks](#)

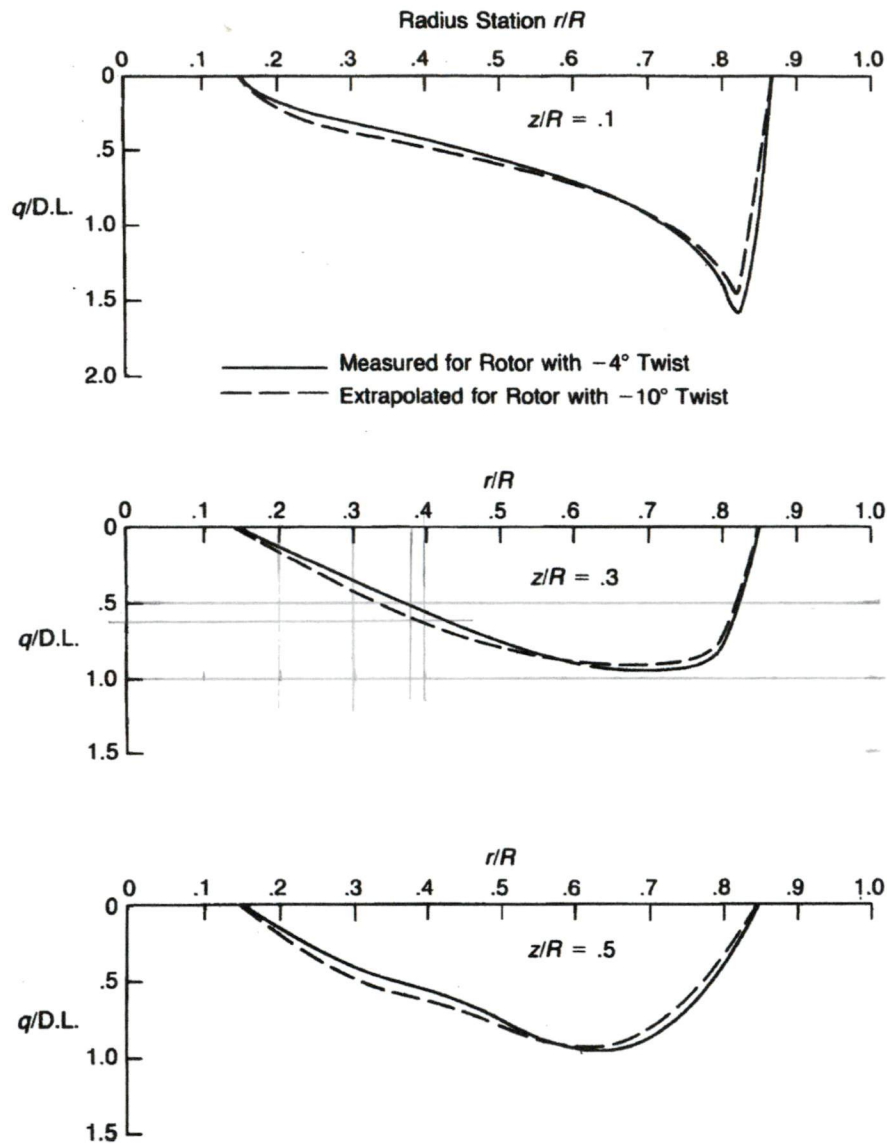



FIGURE 4.6 Distribution of Dynamic Pressure in Wake

Source: Boatwright, "Measurements of Velocity Components in the Wake of a Full-Scale Helicopter Rotor in Hover," USAAMRDL TR 72-33, 1972.

For the example helicopter the mean position of the fuselage is at $Z/D = .12$ and from Figure 1.41 of Chapter 1:

$$\frac{v_{IGE}}{v_{OGE}} = .62$$

BY S.Visweswaraiah CHECKED W. Faessler	 A Textron Company 12,800 RUE DE L'AVENIR, MIRABEL, QUEBEC REPORT FORM	MODEL 429 RPT Cargo Basket	PAGE 1.1
<div>1 Cargo Basket</div> <div>1.1 Analysis</div> <div>429 - Cargo Basket Attachment Analysis - Modified Configuration</div> <div>Contents</div> <div>1.0 Introduction</div> <div>2.0 Loads</div> <div>2.1 Modified Configuration (After the revision of structure and basket repositioning)</div> <div>2.2 Reactions and Attachment locations</div> <div>2.3 Previous loads (Before the revision of structure and basket repositioning)</div> <div>3.0 Fastener Load Calculations</div> <div>3.1 Modified configuration - No drag load</div> <div>3.2 Modified configuration - With drag load</div> <div>3.3 Modified configuration - With Empty basket</div> <div>4.0 Analysis</div> <div>5.0 Conclusion</div> <div>L:\1.SV.000.GEN.CargoBasket.Modified.Configuration.Analysis.xlsm B.: 1.0.2.0 Ptl.: Feb-10-14</div>			

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BY <u>S.Visweswaraiah</u>	Bell Helicopter A Textron Company 12,800 RUE DE L'AVENIR, MIRABEL, QUEBEC REPORT FORM	MODEL <u>429</u> PAGE <u>1.2</u>
CHECKED <u>W. Faessler</u>		RPT. <u>Cargo Basket</u>

1.0 Introduction

The revision to the structure for S/N 57080 and subsequent shifts the Cargo basket forward by 1.5" and the changed step configuration moves the attachments closer together, which increases the reaction loads.

The current analysis determines if the change in the reaction loads are acceptable.

2.0 Loads

2.1 Modified Configuration (After the revision of structure and basket repositioning)

The loads are provided by the customer and an excerpt of the communication is provided below.

17 December 2013

Walter:

The loads analysis has been revised to account for actual weights of components being installed and locations for attachments. The revision to the structure for S/N 57080 and subsequent shifts the basket forward about 1.5" and the changed step configuration moves the attachments closer together, which increases the reaction loads.

The fitting factor of 1.15 has not been included in the calculation of ultimate maneuvering loads on the fitting due to the comparison process being used against the existing step loads, the same as last time. A fitting factor has been applied to the drag load.

The following is our current analysis of the ultimate loads that will be applied by the external cargo basket to the helicopter structure due to maneuvering load factor (3.5g) and drag at V_d . A safety factor of 1.5 has been applied to all loads. Assuming the C of G of the load is at the mid-point of the length of the cargo basket longitudinally and centre of the basket laterally, the critical loads on the support beam attachments were determined using a max cargo load of 275 lb and 300 lb.

The 275 lb cargo load is based on a quick check of the % increase in reaction load over the original configuration, which shows the reaction loads on the bolts attaching the socket fitting to the fuselage frame would exceed the allowable established by the step installation in your original report.

The flight stations (FS) water lines (WL) and butt lines (BL) used in the current analysis for the Bell step attachment locations are based on the drawings provided by Bell, and may be subject to change after a test fit of the installation.

The basket will be similar to the configuration previously approved, however the forward end must be modified to provide clearance from the forward cross tube due to the shift forward mentioned earlier.

This analysis does not include any step loads (opposite side from cargo basket) that may occur during flight conditions. Step provisions have been included in the cargo basket design. Step loads in our design are currently reacted only at the forward and aft ends of the step (FS 162.3 and FS 237.1).

The cargo basket, support beams and attachment fittings have been designed to carry a 300 lb cargo load. Structural compliance for an ultimate maneuvering load factor of 5.25 (3.5 X 1.5) and concurrent ultimate drag load has been demonstrated by test. The beams themselves are not changed, except for the relocation of the mounting points to accommodate the different structure.

Cargo capacity of the cargo basket installation is dependant on the existing helicopter step attachment provisions being able to carry the above ultimate loads.

\\L1SV.000.GEN.CargoBasket.Modified.Configuration.Analysis.xlsm B: ExcelErrorName Prj.: Rev. May-5-010 Prj.: Rev.: May-5-010 Prt.: Feb-10-14

Ref:
Customer Loads Report

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2.0 Loads (contd...)

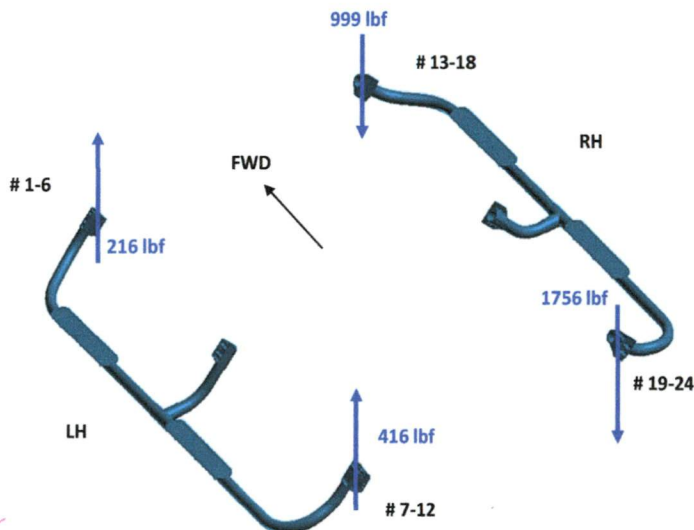
Max. Cargo	Forward	Reactions	Aft	Reactions
	FS	162.3	FS	237.1
	LBL -26.09	RBL 26.09	LBL -26.09	RBL 26.09
(lbs.)	Down	Up	Down	Up
	(lbs.)	(lbs.)	(lbs.)	(lbs.)
300	216.8	999.4	415.9	1756.4
275	200.1	935.6	385.8	1642.1

In addition, the ultimate drag load on the basket was calculated as $P_{\text{drag_ult}} = 602 \text{ lbf}$

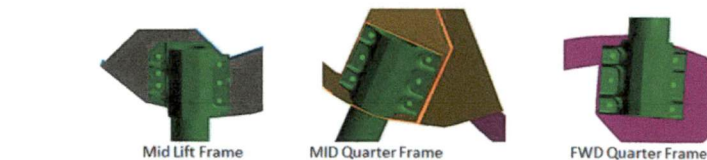
2.2 Reactions and Attachment locations

The PAX step is attached directly to the frames. We assume that the Pax steps were removed and their attachments were used as fixation points for the Cargo basket (at the FW Quarter Frame, the Mid Quarter Frame and Mid Lift Frame) using 6 fasteners.

The critical location is the RHS, so the LHS is passed by inspection.



Fastener	x	y	z
1	162.3	-21.1	9.8
2	162.3	-21.8	9.1
3	162.3	-22.5	8.4
4	162.3	-22.9	11.6
5	162.3	-23.6	10.9
6	162.3	-24.3	10.2
7	237.1	-20.7	10.1
8	237.1	-21.3	9.5
9	237.1	-21.6	9.2
10	237.1	-22.9	11.6
11	237.1	-23.4	11.0
12	237.1	-24.0	10.5
13	162.3	21.1	9.8
14	162.3	21.8	9.1
15	162.3	22.5	8.4
16	162.3	22.9	11.6
17	162.3	23.6	10.9
18	162.3	24.3	10.2
19	237.1	20.7	10.1
20	237.1	21.3	9.5
21	237.1	21.6	9.2
22	237.1	22.9	11.6
23	237.1	23.4	11.0
24	237.1	24.0	10.5



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2.0 Loads (contd...)**2.3 Previous loads (Before the revision of structure and basket repositioning)**

Max. Cargo	Forward	Reactions	Aft	Reactions
	FS	163.8	FS	238.6
	LBL -27.8	RBL 27.8	LBL -27.8	RBL 27.8
(lbs.)	Down	Up	Down	Up
	(lbs.)	(lbs.)	(lbs.)	(lbs.)
300	270	1325	352	1676
250	230	1153	301	1456
200	190	981	250	1236

In addition, the ultimate drag load on the basket was calculated as $P_{\text{drag_ult}} = 817 \text{ lbf}$

3.0 Fastener Load Calculations

Bolt Group Analysis is performed to obtain the loads at each of the fastener locations.

Three configurations are recognized to perform the fastener load calculations.

1. Modified configuration - No drag load
2. Modified configuration - With drag load
3. Modified configuration - With empty basket

The worst loads of the above configurations are considered for the analysis.

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CHECKED <u>W. Faessler</u>		RPT. <u>Cargo Basket</u>

3.0 Fastener Load Calculations (contd....)**3.1 Modified configuration - No drag load**

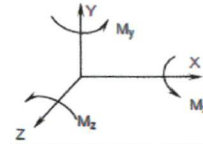
Critical location: RHS AFT

3-D Weighted fastener pattern analysis(Ref. CASA program CV017P)

Applied Loads (Ultimate)									
1 Load #	2 F _x [lb]	3 F _y [lb]	4 F _z [lb]	5 M _x [lb-in]	6 M _y [lb-in]	7 M _z [lb-in]	8 X _i [in.]	9 Y _i [in.]	10 Z _i [in.]
1	0.0	0.0	-1756.4	0.0	0.0	0.0	237.10	26.09	9.00
2	0.0	0.0	0.0	0.0	0.0	0.0	237.10	26.09	9.00
3	0.0	0.0	-999.4	0.0	0.0	0.0	162.30	26.09	9.00
4	0.0	0.0	0.0	0.0	0.0	0.0	162.30	26.09	9.00
5	0.0	0.0	0.0	0.0	0.0	0.0	210.30	44.75	9.00
6									

Ref. Page
Ref. Page
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Group Properties				Resultant loads about centroid			
X _{xy} : 199.700		I _x : 26.48		F _x : 0.0			
Y _{xy} : 22.530		I _y : 16796.01		F _y : 0.0			
		I _z : 16800.71		F _z : -2755.8			
Y _{yz} : 22.530				M _x : -9811.4			
Z _{yz} : 10.163				M _y : 28311.8			
X _{xz} : 199.700		I _{xy} : -91.23		M _z : 0.0			
Z _{xz} : 10.163		I _{yz} : 6.10					
		I _{xz} : 66.71					



11 Fast- ener	12 X [in.]	13 Y [in.]	14 Z [in.]	15 A _x	16 A _y	17 A _z	18 P _x [lb]	19 P _y [lb]	20 P _z [lb]	21 P _{shear} [lb]	22 P _{shear} [lb]
1	162.3	-21.1	9.8	0.00	0.00	0.00					
2	162.3	-21.8	9.1	0.00	0.00	0.00					
3	162.3	-22.5	8.4	0.00	0.00	0.00					
4	162.3	-22.9	11.6	0.00	0.00	0.00					
5	162.3	-23.6	10.9	0.00	0.00	0.00					
6	162.3	-24.3	10.2	0.00	0.00	0.00					
7	237.1	-20.7	10.1	0.00	0.00	0.00					
8	237.1	-21.3	9.5	0.00	0.00	0.00					
9	237.1	-21.8	9.2	0.00	0.00	0.00					
10	237.1	-22.9	11.6	0.00	0.00	0.00					
11	237.1	-23.4	11.0	0.00	0.00	0.00					
12	237.1	-24.0	10.5	0.00	0.00	0.00					
13	162.3	21.1	9.8	1.00	1.00	1.00	-3	-66	451	-3	456
14	162.3	21.8	9.1	1.00	1.00	1.00	-5	-338	183	-5	384
15	162.3	22.5	8.4	1.00	1.00	1.00	-7	-609	-85	-7	615
16	162.3	22.9	11.6	1.00	1.00	1.00	6	609	-249	6	657
17	162.3	23.6	10.9	1.00	1.00	1.00	4	337	-517	4	617
18	162.3	24.3	10.2	1.00	1.00	1.00	3	66	-785	3	788
19	237.1	20.7	10.1	1.00	1.00	1.00	-3	-90	318	-3	331
20	237.1	21.3	9.5	1.00	1.00	1.00	-4	-298	112	-4	319
21	237.1	21.8	9.2	1.00	1.00	1.00	-5	-442	-30	-5	443
22	237.1	22.9	11.6	1.00	1.00	1.00	6	494	-504	6	706
23	237.1	23.4	11.0	1.00	1.00	1.00	5	277	-719	5	770
24	237.1	24.0	10.5	1.00	1.00	1.00	3	59	-934	3	936

max 6.0 935.9
min -6.5 318.6
max 936 lb

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CHECKED <u>W. Faessler</u>		RPT. <u>Cargo Basket</u>

3.0 Fastener Load Calculations (contd....)**3.2 Modified configuration - With drag load**

The drag load due to the basket will be reacted by the RH.

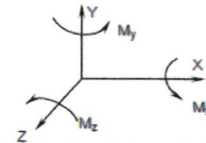
Critical location: RHS AFT

3-D Weighted fastener pattern analysis(Ref. CASA program CV017P)

Applied Loads (Ultimate)									
Forces			Moments			Loads Coordinates			
1 Load #	2 F _x [lb]	3 F _y [lb]	4 F _z [lb]	5 M _x [lb-in]	6 M _y [lb-in]	7 M _z [lb-in]	8 X _i [in.]	9 Y _i [in.]	10 Z _i [in.]
1	0.0	0.0	-1758.4	0.0	0.0	0.0	237.10	26.09	9.00
2	0.0	0.0	0.0	0.0	0.0	0.0	237.10	-26.09	9.00
3	0.0	0.0	-999.4	0.0	0.0	0.0	162.30	26.09	9.00
4	0.0	0.0	0.0	0.0	0.0	0.0	162.30	-26.09	9.00
5	602.0	0.0	0.0	0.0	0.0	0.0	210.30	44.75	9.00
6									

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Group Properties			Resultant loads about centroid		
X _{xy} : 199.700	I _x : 26.48		F _x : 602.0		
Y _{xy} : 22.530	I _y : 16796.01		F _y : 0.0		
	I _z : 16800.71		F _z : -2755.8		
Y _{yz} : 22.530			M _x : -9811.4		
Z _{yz} : 10.163			M _y : 27611.6		
X _{yz} : 199.700	I _{xy} : -91.23		M _z : -13376.6		
Z _{xz} : 10.163	I _{yz} : 6.10				
	I _{zx} : 66.71				



11 Fastener	12 X [in.]	13 Y [in.]	14 Z [in.]	15 Ax	16 Ay	17 Az	18 Px [lb]	19 Py [lb]	20 Pz [lb]	21 P _{axial} [lb]	22 P _{shear} [lb]
1	162.3	-21.1	9.8	0.00	0.00	0.00					
2	162.3	-21.8	9.1	0.00	0.00	0.00					
3	162.3	-22.5	8.4	0.00	0.00	0.00					
4	162.3	-22.9	11.6	0.00	0.00	0.00					
5	162.3	-23.6	10.9	0.00	0.00	0.00					
6	162.3	-24.3	10.2	0.00	0.00	0.00					
7	237.1	-20.7	10.1	0.00	0.00	0.00					
8	237.1	-21.3	9.5	0.00	0.00	0.00					
9	237.1	-21.6	9.2	0.00	0.00	0.00					
10	237.1	-22.9	11.6	0.00	0.00	0.00					
11	237.1	-23.4	11.0	0.00	0.00	0.00					
12	237.1	-24.0	10.5	0.00	0.00	0.00					
13	162.3	21.1	9.8	1.00	1.00	1.00	46	-37	453	46	454
14	162.3	21.8	9.1	1.00	1.00	1.00	45	-309	183	45	360
15	162.3	22.5	8.4	1.00	1.00	1.00	44	-582	-86	44	588
16	162.3	22.9	11.6	1.00	1.00	1.00	56	641	-251	56	689
17	162.3	23.6	10.9	1.00	1.00	1.00	55	369	-520	55	637
18	162.3	24.3	10.2	1.00	1.00	1.00	54	96	-789	54	795
19	237.1	20.7	10.1	1.00	1.00	1.00	46	-120	323	46	344
20	237.1	21.3	9.5	1.00	1.00	1.00	45	-329	116	45	349
21	237.1	21.6	9.2	1.00	1.00	1.00	44	-474	-27	44	475
22	237.1	22.9	11.6	1.00	1.00	1.00	56	467	-503	56	687
23	237.1	23.4	11.0	1.00	1.00	1.00	56	248	-719	56	761
24	237.1	24.0	10.5	1.00	1.00	1.00	55	30	-936	55	936

max 56.5 936.1
min 43.7 344.4
max 938 lbL:\SV\0013\DBG\CargoBasket\Fastenerloadcalculations.xlsm B: 2.7 Ptl: ExLoad System429wld.sponson.wth.dulld05 Rev. May-5-010 Ptl: Feb-6-14
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CHECKED <u>W. Faessler</u>		RPT. <u>Cargo Basket</u>

3.0 Fastener Load Calculations (contd....)**3.3 Modified configuration - With Empty basket**

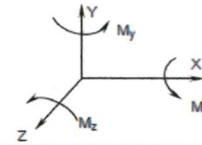
Critical location: RHS AFT

3-D Weighted fastener pattern analysis(Ref. CASA program CV017P)

Applied Loads (Ultimate)									
1 Load #	2 F _x [lb]	3 F _y [lb]	4 F _z [lb]	5 M _x [lb-in]	6 M _y [lb-in]	7 M _z [lb-in]	8 X _i [in.]	9 Y _i [in.]	10 Z _i [in.]
1	0.0	0.0	0.0	0.0	0.0	0.0	237.10	26.09	9.00
2	0.0	0.0	0.0	0.0	0.0	0.0	237.10	-26.09	9.00
3	0.0	0.0	0.0	0.0	0.0	0.0	162.30	26.09	9.00
4	0.0	0.0	0.0	0.0	0.0	0.0	162.30	-26.09	9.00
5	602.0	0.0	0.0	0.0	0.0	0.0	210.30	44.75	9.00
6									

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Group Properties				Resultant loads about centroid			
X _{xy} : 199.700	I _x : 26.48	F _x : 602.0					
Y _{xy} : 22.530	I _y : 16796.01	F _y : 0.0					
	I _z : 16800.71	F _z : 0.0					
Y _{yz} : 22.530	I _{xy} : -91.23	M _x : 0.0					
Z _{yz} : 10.163	I _{yz} : 6.10	M _y : -700.2					
X _{yz} : 199.700	I _{yz} : 6.10	M _z : -13376.6					
Z _{yz} : 10.163	I _{yz} : 66.71						



11 Fast- ener	12 X [in.]	13 Y [in.]	14 Z [in.]	15 Ax	16 Ay	17 Az	18 Px [lb]	19 Py [lb]	20 Pz [lb]	21 P _{axial} [lb]	22 P _{shear} [lb]
1	162.3	-21.1	9.8	0.00	0.00	0.00					
2	162.3	-21.8	9.1	0.00	0.00	0.00					
3	162.3	-22.5	8.4	0.00	0.00	0.00					
4	162.3	-22.9	11.6	0.00	0.00	0.00					
5	162.3	-23.6	10.9	0.00	0.00	0.00					
6	162.3	-24.3	10.2	0.00	0.00	0.00					
7	237.1	-20.7	10.1	0.00	0.00	0.00					
8	237.1	-21.3	9.5	0.00	0.00	0.00					
9	237.1	-21.8	9.2	0.00	0.00	0.00					
10	237.1	-22.9	11.6	0.00	0.00	0.00					
11	237.1	-23.4	11.0	0.00	0.00	0.00					
12	237.1	-24.0	10.5	0.00	0.00	0.00					
13	162.3	21.1	9.8	1.00	1.00	1.00	49	29	1	49	29
14	162.3	21.8	9.1	1.00	1.00	1.00	50	28	0	50	28
15	162.3	22.5	8.4	1.00	1.00	1.00	50	27	-1	50	27
16	162.3	22.9	11.6	1.00	1.00	1.00	50	33	-2	50	33
17	162.3	23.6	10.9	1.00	1.00	1.00	51	31	-3	51	32
18	162.3	24.3	10.2	1.00	1.00	1.00	52	30	-5	52	30
19	237.1	20.7	10.1	1.00	1.00	1.00	49	-30	5	49	31
20	237.1	21.3	9.5	1.00	1.00	1.00	49	-31	4	49	31
21	237.1	21.8	9.2	1.00	1.00	1.00	49	-32	3	49	32
22	237.1	22.9	11.6	1.00	1.00	1.00	50	-27	1	50	27
23	237.1	23.4	11.0	1.00	1.00	1.00	51	-28	-1	51	28
24	237.1	24.0	10.5	1.00	1.00	1.00	51	-29	-2	51	30

max
min
max
51.6
48.7
61 lb
32.8
26.8\\L:\SV\001\3\DBG\CargoBasket\Fastenerloadcalculations.xlsm B: 2.7 Prt: E:\Load System\429\wg.sponson.wth.dul\05 Rev. May-5-010 Prt: Feb-6-14
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4.0 Analysis

The loads calculated are compared with the 429-030-400 Passenger Step Interface loads.

	429 Design load	Reference	Cargo Basket load
Max tension	483 lb Ultimate	429-030-400 / 4.26.9 Passenger Step Interface	51.6 lb Max axial load Ultimate
Max Shear	989 lb Ultimate	429-030-400 / 4.26.9 Passenger Step Interface	936.1 lb Max shear load Ultimate
Max compression	-421 lb Ultimate	429-030-400 / 4.26.9 Passenger Step Interface	51.6 lb Max axial load amplitude Ultimate

5.0 Conclusion

The loads induced due to the Modified Cargo Basket Configuration are over than original 429 step design loads. The critical location is RHS, and LHS is passed by inspection.

The modified Cargo basket installation is therefore structurally acceptable for the 429 airframe

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Table 13-3. Alternates for Bell Helicopter Textron Adhesives (Cont)

BELL SPEC (ITEM NO.)	ALTERNATE	CURE TEMP	CURE TIME	CURE PRESSURE	STORAGE LIFE	PRIMER
299-947-100, Type II, Class 3 (C-363)	Hysol EA956	Room temp or 195 to 205°F (91 to 96°C) (alternate)	5 to 7 days or 55 to 65 minutes (alternate)	None or firm contact to 10 PSI (69 kPa) (alternate)	12 months below 40°F (4°C) or 90 days at 40 to 85°F (4 to 29°C) or 60 days at 85 to 100°F (29 to 38°C)	None
	Magnobond 6367	Room temp or 190 to 210°F (88 to 99°C) (alternate)	5 to 7 days or 55 to 65 minutes (alternate)	None or firm contact to 10 PSI (69 kPa)	12 months below 40°F (4°C) or 90 days at 40 to 85°F (4 to 29°C) or 60 days at 85 to 100°F (29 to 38°C)	None
299-947-100, Type II, Class 4	EC 1469	320 to 340°F (160 to 171°C) or 340 to 360°F (171 to 182°C) (alternate)	55 to 65 minutes or 50 to 60 minutes (alternate)	Firm contact to 10 PSI (69 kPa)	12 months below 40°F (4°C) or 90 days at 40 to 85°F (4 to 29°C) or 60 days at 85 to 100°F (29 to 38°C)	None
299-947-107, Type I, Class 1 (C-324)	Pro-Seal 596	Join after tacky stage when heated to 250 to 260°F (121 to 127°C)	None	Firm contact	180 days at 40 to 80°F (4 to 27°C)	None
	Scotchgrip 1300	Join after tacky stage at room temp	5 to 10 minutes	Firm contact	180 days at 40 to 80°F (4 to 27°C)	None
	Scotchgrip 1300L		Per manufacturers instructions		180 days at 40 to 80°F (4 to 27°C)	None

Table 13-1. Consumable Materials List — Item Number Versus Nomenclature (Cont)

ITEM NO.	NOMENCLATURE	SPECIFICATION	BELL ORDER NO.	ORDER QTY	MATERIAL	CAGE/FSCM/ SOURCE
C-394	De-icing/Anti-icing Fluid, Aircraft, SAE Type I	AMS 1424	OCTAFLO DILUTE TYPE1	5 GAL	Octaflo Type I	82925
		AMS 1424	None	N/A	Kilfrost DF Plus (88)	4V360
C-395	Titanium Cleaner		PASAJEL107	1 QT	Pasa-Jell 107	2B665
C-396	Sealing Compound, Polythioether, Fuel and High Temperature	MIL-S-29574, Type I, Class B-1/2	MILS29574TYI CLB 6OZ	6 OZ	Any product meeting specification	Commercial
C-397	Adhesive, Room Temperature Cure, High Peel Strength	299-947-125, Type II, Class 2	299-947-125TY2 CL2	1 QT	EA 9320NA	33564
C-398	Detergent, General Purpose, Nonionic Liquid	MIL-D-16791				Commercial
C-399	Adhesive, Urethane Superfast, Windows				3M No. 08609	04963
C-400	Insulation, Thermal, Aluminum Backed Fiberglass, Reflective Facing	ASTM C665, Type III	150-026	4 SQ FT	Any product meeting specification	Commercial
C-401	Tape, Aluminum Foil/Glass Cloth, High Temperature	None	363,2.00 WIDE	Roll (2 wide)	3M No. 363	04963
C-402	Use C-401	None	None	N/A	Use C-401	N/A
C-403	Tape, Adhesive, Pressure Sensitive, Glass Cloth, Heat Resistant	299-947-110, Type I	361,2IN	Roll (2 wide)	3M No. 361	76381
C-404 S-404	Glass Cloth, 0.010 inch thick	AMS-C-9084, Class 2, Type VIIIA	AMS-C-9084CL2 TY8A	Roll (1 LB)	Any product meeting specification	Commercial
		AMS-C-9084, Class 1, Type VIIIA	MILC9084 CL1 TY8A	3 SQ FT	Any product meeting specification	Commercial
		AMS-C-9084, Class 2, Type VIIIB	AMS-C-9084T8B CL2	3 SQ FT	Any product meeting specification	Commercial
C-405 EC-025	Wire, Safety, CRES, 0.032, AS100028	AS5685	AS100028	Roll (5 LB)		Commercial

Table 13-2. Consumable Materials List — Nomenclature Versus Item Number (Cont)

NOMENCLATURE	ITEM NO.	SPECIFICATION	BELL ORDER NO.	ORDER QTY	MATERIAL	CAGE/FSCM/SOURCE
Cadmium Chromate Conversion Coating	C-112 EC-085	None	None	N/A	SSS 3002, Brush	76071
	C-112	None	DALIC 5005	1 QT	Dalic 5005, Brush	11924
Cadmium Plating Solution, Brush-on	C-108	MIL-STD-865	LHE SELECTRON SPS507	1 QT	5070	11924
	C-108	MIL-STD-865	None	N/A	LDC 4803	57868
	C-108	MIL-STD-865	None	N/A	2023	11924
Calcium Fluoride [CaF ₂], Technical Grade	C-113	MIL-C-11162	CALCIUM FLOURIDE	1 LB	Calcium Fluoride	Commercial
Calcium Sulfate [CaSO ₄], Technical Grade	C-120	None	CALCIUM SULFATE	4.4 LB	Calcium Sulfate	Commercial
	C-120	None	CALCIUM SULFATE 1.0	1.3 OZ	Calcium Sulfate	Commercial
Caps and Plugs, ESDS Protective, Electrical Connector	C-136	None	None	N/A	3M No. 4270	20999
Caps and Plugs, Protective, Dust and Moisture Seal	C-428	NAS 847	None	N/A	Any product meeting specification	Commercial
Caps and Plugs, Protective, Electrical Connector	C-156	NAS 820	None	N/A	Any product meeting specification	Commercial
Carbon Fabric, Woven, Dry, Plain Weave	C-255	299-947-499, Type II, Class 2, Form 3K-PW	None	N/A	PW 60 195GSMTR7X12AS4 GP-3K	0LHZ4
	C-255	299-947-499, Type II, Class 2, Form 3K-PW	PW42195GSMTR 7X12AS4	1 FT	PW 42 195GSMTR7X12AS4 GP-3K	0LHZ4
Carbon Fabric, Woven, Epoxy Resin-Impregnated	C-155	299-947-321, Type II, Class B	299-947-321TYIIC LB	1 LB	HMF 937A/5HS	0LHZ4

Table 13-3. Alternates for Bell Helicopter Textron Adhesives (Cont)

BELL SPEC (ITEM NO.)	ALTERNATE	CURE TEMP	CURE TIME	CURE PRESSURE	STORAGE LIFE	PRIMER
299-947-099 (C-313)	Araldite AV1258/ HV1258	Room temp or 145 to 180°F (63 to 82°C) (alternate)	24 hours or 30 minutes (alternate)	Firm contact	12 months at 40 to 80°F (4 to 27°C) or 18 months below 40°F (4°C)	None
299-947-100, Type I, Class 6	EC 3448	225 to 300°F (107 to 149°C)	55 to 65 minutes	Firm contact to 10 PSI (69 kPa)	180 days below 0°F (-18°C)	None
299-947-100, Type II, Class 2 (C-317)	Magnobond 6398	Room temp or 190 to 210°F (88 to 99°C) (alternate)	5 to 7 days or 55 to 65 minutes (alternate)	None or firm contact to 10 PSI (69 kPa) (alternate)	12 months below 40°F (4°C) or 90 days at 40 to 85°F (4 to 29°C) or 60 days at 85 to 100°F (29 to 38°C)	None
	Hysol EA934NA	Room temp or 175 to 185°F (80 to 85°C) (alternate)	5 to 7 days or 55 to 65 minutes (alternate)	None or firm contact to 10 PSI (69 kPa) (alternate)	12 months below 40°F (4°C) or 90 days at 40 to 85°F (4 to 29°C) or 60 days at 85 to 100°F (29 to 38°C)	None
	Hysol EA9392	Room temp or 175 to 185°F (80 to 85°C) (alternate)	5 to 7 days or 55 to 65 minutes (alternate)	None or firm contact to 10 PSI (69 kPa) (alternate)	12 months below 40°F (4°C) or 90 days at 40 to 85°F (4 to 29°C) or 60 days at 85 to 100°F (29 to 38°C)	None

WARNING

HIGH TEMPERATURE CURE, AS DESCRIBED IN STEP 3.3 AND IN TABLE 4-12, IS NOT TO BE USED FOR WET LAYUP REPAIRS OF CARBON FIBER REINFORCED COMPOSITE PARTS.

- 3.3 For repairs cured at or above 200°F (93.3°C), heat may be applied using the following equipment. A minimum of two thermocouples around periphery of repair doubler at expected points of highest and lowest temperatures must monitor cure temperature. The thermocouples' readings must fall within specified temperature range at all times. More than two thermocouples may be used around periphery of repair plies if location of highest and lower temperatures is unknown.
- 3.3.1 An oven may be used if part can be removed from helicopter.
- 3.3.2 A Bell Helicopter Textron approved hot bonding unit, or equivalent, in conjunction with a heat blanket capable of maintaining a minimum of 250°F (121.1°C).

Table 4-10. Standard Cure at Room Temperature

Epoxy Resin (C Code)	Standard Cure at Room Temperature ⁽¹⁾		
	Temperature and Time	Dead Weight Pressure ⁽²⁾	Vacuum Bag (Alternate)
Magnobond 6367 (C-363) and (C-512)	70 to 95°F (21 to 35°C) for 24 hours (Handling strength) ⁽³⁾	0.5 to 1.0 PSI (3.45 to 68.95 kPa)	First 4 hours at 25 inches (635 mm) H _G minimum
	70 to 95°F (21 to 35°C) for 7 days (Full strength) ⁽⁴⁾		
Hysol EA956 (C-363)	70 to 95°F (21 to 35°C) for 24 hours (Handling strength)	0.5 to 1.0 PSI (3.45 to 68.95 kPa)	First 4 hours at 25 inches (635 mm) H _G minimum
	70 to 95°F (21 to 35°C) for 7 days (Full strength)		
Hysol EA9309NA (C-331)	70 to 95°F (21 to 35°C) for 24 hours (Handling strength)	0.5 to 1.0 PSI (3.45 to 68.95 kPa)	First 4 hours at 25 inches (635 mm) H _G minimum
	70 to 95°F (21 to 35°C) for 72 hours (Full strength)		

NOTES:

1. This cure applies to wet layup repairs of both glass and carbon fiber reinforced composite parts.
2. Apply a uniform pressure of 0.5 to 1.0 PSI (3.4 to 6.9 kPa) to surface of repair when a pressure is not specified and a vacuum bag is not used.
3. Handling strength: The resin or adhesive has more than sufficient strength for the purpose of moving the part being handled to the next operation.
4. Full strength: Resin or adhesive is at full (100%) strength, which is necessary to withstand design loads that the part is subjected to during operation of helicopter.

4-3-6. CURING PROCESS FOR WET LAYUP USING EPOXY RESIN

Table 4-10. Standard Cure at Room Temperature

Epoxy Resin (C Code)	Standard Cure at Room Temperature ⁽¹⁾		
	Temperature and Time	Dead Weight Pressure ⁽²⁾	Vacuum Bag (Alternate)
Hysol EA9320NA (C-397)	70 to 95°F (21 to 35°C) for 24 hours (Handling strength)	0.5 to 1.0 PSI (3.45 to 68.95 kPa)	First 4 hours at 25 inches (635 mm) H _G minimum
	70 to 95°F (21 to 35°C) for 7 days (Full strength)		
Epon 828 DTA (C-219) and (C-220)	70 to 95°F (21 to 35°C) for 24 hours (Handling strength)	0.5 to 1.0 PSI (3.45 to 68.95 kPa)	First 4 hours at 25 inches (635 mm) H _G minimum
	70 to 95°F (21 to 35°C) for 7 days (Full strength)		

NOTES:

1. This cure applies to wet layup repairs of both glass and carbon fiber reinforced composite parts.
2. Apply a uniform pressure of 0.5 to 1.0 PSI (3.4 to 6.9 kPa) to surface of repair when a pressure is not specified and a vacuum bag is not used.
3. Handling strength: The resin or adhesive has more than sufficient strength for the purpose of moving the part being handled to the next operation.
4. Full strength: Resin or adhesive is at full (100%) strength, which is necessary to withstand design loads that the part is subjected to during operation of helicopter.

Table 4-11. Room Temperature Cure with Post-cure

Epoxy Resin (C Code)	Room Temperature Cure with Post-cure ⁽¹⁾	
	Temperature and Time	Vacuum Bag
Magnobond 6367 (C-363) and (C-512)	Cure: 70 to 95°F (21 to 35°C) for 24 hours	Cure: First 4 hours at 25inches H _G (635 mm) minimum
	Post-cure: Heat up rate 1 to 5°F (0.6 to 2.8°C) per minute 200 +10/-40°F (93.3 +5.6/-22.2°C) for 120 ±10 minutes Cool down rate 1 to 5°F (0.6 to 2.8°C) per minute	Post-cure: Vacuum bag optional
Hysol EA956 ⁽²⁾ (C-363)	Cure: 70 to 95°F (21 to 35°C) for 24 hours	Cure: First 4 hours at 25inches H _G (635 mm) minimum
	Post-cure: Heat up rate 1 to 5°F (0.6 to 2.8°C) per minute 200 +10/-40°F (93.3 +5.6/-22.2°C) for 120 ±10 minutes Cool down rate 1 to 5°F (0.6 to 2.8°C) per minute	Post-cure: Vacuum bag optional
NOTES: 1. This cure applies to wet layup repairs of both glass and carbon fiber reinforced composite parts although it is the preferred cure for all wet layup repairs of carbon fiber reinforced composite parts, but is mandatory when repair is structural. 2. This resin is not approved for structural wet layup repairs of carbon fiber reinforced composite parts.		

WARNING

HIGH TEMPERATURE CURE, AS DESCRIBED IN TABLE 4-12, IS NOT TO BE USED FOR WET LAYUP REPAIRS OF CARBON FIBER REINFORCED COMPOSITE PARTS.

NEVER PERFORM HIGH TEMPERATURE CURE, AS DESCRIBED IN TABLE 4-12, TO MORE THAN 0.33 POUND (150 GRAMS) OF RESIN AT A TIME.

Table 4-12. High Temperature Cure

Epoxy Resin (C Code)	High Temperature Cure ⁽¹⁾		
	Temperature and Time	Dead Weight Pressure ⁽²⁾	Vacuum Bag (Alternate)
Magnobond 6367 (C-363) and (C-512)	Heat up rate 1 to 5°F (0.6 to 2.8°C) per minute 200 ±10°F (93.3 ±5.6°C) for 60 minutes Cool down rate 1 to 5°F (0.6 to 2.8°C) per minute	0.5 to 1.0 PSI (3.45 to 68.95 kPa)	60 minutes at 25 inches H _G (635 mm) minimum
Hysol EA956NA (C-363)	Heat up rate 1 to 5°F (0.6 to 2.8°C) per minute 200 ±10°F (93.3 ±5.6°C) for 60 minutes Cool down rate 1 to 5°F (0.6 to 2.8°C) per minute	0.5 to 1.0 PSI (3.45 to 68.95 kPa)	60 minutes at 25 inches H _G (635 mm) minimum
Hysol EA9309NA (C-331)	Heat up rate 1 to 5°F per minute 180 ±5°F (82.2 ±2.8°C) for 60 minutes Cool down rate 1 to 5°F (0.6 to 2.8°C) per minute	0.5 to 1.0 PSI (3.45 to 68.95 kPa)	60 minutes at 25 inches H _G (635 mm) minimum
Hysol EA9320NA (C-397)	Heat up rate 1 to 5°F per minute 180 ±5°F (82.2 ±2.8°C) for 60 minutes Cool down rate 1 to 5°F (0.6 to 2.8°C) per minute	0.5 to 1.0 PSI (3.45 to 68.95 kPa)	60 minutes at 25 inches H _G (635 mm) minimum
Epon 828 DTA (C-219) and (C-220)	Heat up rate 1 to 5°F per minute 180 ±5°F (82.2 ±2.8°C) for 120 minutes Cool down rate 1 to 5°F (0.6 to 2.8°C) per minute	0.5 to 1.0 PSI (3.45 to 68.95 kPa)	120 minutes at 25 inches H _G (635 mm) minimum
NOTES: 1 This cure applies only to wet layup repairs of glass fiber reinforced composite parts. 2. Apply a uniform pressure of 0.5 to 1.0 PSI (3.4 to 6.9 kPa) to surface of repair when a pressure is not specified and a vacuum bag is not used.			



Transport
Canada

Transports
Canada

Type Certificate Data Sheet

(Continuation Sheet)

Number: H-107 Issue: 3

Datum	Model 429 Station 0 datum is 183.6 cm (72.3 in.) forward of the nose of the aircraft.
Levelling Means	Protractor or level placed on the crew or passenger floor or seat rails, both longitudinally and laterally.
Minimum Crew	1 pilot
Maximum Occupants	8 (includes crew)
Maximum Cargo	Refer to Rotorcraft Flight Manual for Loading Schedule.
Fuel Capacity	Refer to Rotorcraft Flight Manual for Fuel Capacity.
Oil Capacity	Refer to Rotorcraft Maintenance Manual for Oil Capacity.
Altitude Limits	Maximum altitude 6,096 m (20,000 ft.) pressure altitude.
OAT Limits	-40°C (-40°F) to +51.7°C (+125°F)
Certification Basis (See NOTE 2)	<p><u>Normal Category:</u></p> <p>a) Airworthiness Manual (AWM) Chapter 527 - <i>Normal Category Rotorcraft</i> at Change 527-9 published December 1, 2009 (equivalent to FAR Part 27 at Amdt 27-44), including Appendix B for IFR and Appendix C for Category A, except for AWM 527.1457 and 527.1459 at Change 527-6, plus:</p> <p>FAR Part 27, Amdt 27-44, effective June 16, 2008 as adopted by reference.</p> <p>AWM Chapter 527 Appendix C - <i>Criteria for Category A</i> specifies certain sections of AWM Chapter 529 - <i>Transport Category Rotorcraft</i>. For these specified sections, AWM Chapter 529 at Change 529-6 published June 30, 2008 (equivalent to FAR 29 at Amdt 29-45) is applicable, plus FAR 29.1587(a)(7) Amdt 29-51, effective March 31, 2008 as adopted by reference.</p>

DAR 304's comments wrt ER959.03_0draft1.pdf and {ER959.03_0draft2.pdf}

Engineering Report, ER959.03

Bell 429, Quick Release Cargo Basket

{Please add a title; "DESIGN LOADS" or something similar}

? S/N 67081 & Sub. Configuration {Corrected to 57081, Aero Design to recheck all docs.} Done
DRAFT

Revision 0, 14 March 2014, 16 Pages

By: Jeff Clarke, P.Tech.(Eng.)

Aero Design Ltd

Cover Page

As above.

Okay

ToC Page

Okay

Page 3

1.0 Introduction

Include "delta" type comments wrt the original ER. Done {Okay} ✓

i.e.; copy a the important comments from the delta project description.

{The compliance/cert plan demonstrates the compliance with the BOC.

I believe that this report to establish the ultimate design loads for the test plans noted? or ??? Please update to suit.} → and exits?

2.0 Reference Text

Include document rev/date, titles, descriptions and "delta" type notes. Done {Okay} ✓
[Don't include Ref Text - These are DAR's ref/check notes]

Engineering Reports;

{Move ER842.01 to the top of the list and please supply me with a copy.} ✓

Should include references to;

TR959.04, 0, 14 Mar 14, Attachment Fitting Load Test

WRT TR959.04 Where is Bell's acceptance that the airframe fittings can resolve these test loads? Still awaiting Bell

Are you making the 05/04 type Pins? Yes

Installed with tapered pins? No, NAS6605 bolts (fwd) and Bell 5/16 stud (17-4 CRES precip hardened to 155-175 ksi)

For test will be grade 8 5/16" bolts as indicated

Instructions wrt installing the tapered pins?

Round all test values to the nearest pound. Done

{Okay above} ✓

TR959.05, 0, 14 Mar 14, Carbon Fibre Panel Load Tests.

[BTW, Does the ICA include any special inspection notes wrt the Carbon Fibre components?] Yes {Please provide a draft copy.} ✓

WRT TR959.05 & this report are there any life-time knock-down factors applicable to carbon fibre parts?

i.e.; analysis and testing to include a 1.X factor? **Yes, 1.5**

{As noted at the bottom of page 5;

CAR 527.619 Variability factor applied to carbon fibre components $n_{vf} = 1.5$

vs. "CAR 527.619 Special Factors, (3) Subject to appreciable variability due to:" uncertainties in manufacturing or inspection.

This is an important and valid consideration.

I was thinking more about (2) "Likely to deteriorate in service..." n service factor knock down or nkd

Can you please provide reference to the publication/s for your 1.5 variability value and a 1.0 deterioration value? [I've accepted a 1.7 factor for a synthetic rope after 10 years of service. I would expect your factor to be lower.] ✓

This panel is "more" structural than I originally believed.

i.e.; it seems to be more than the "rain shield" that I described to TCCA.

Please provide photos drawing of top side of the lid.

i.e.; the panel loads are transferred to the lid's steel tubes.

Photos / drawing emailed. {Thanks and I've seen the drawing and lay-up SI.} ✓

ER959.01, Rev 0, 6 Sept 12, Quick Release Cargo Basket

Compliance Report, Approved by; DAR 290M

Delta Info; no change to construction or loads? **Done {Good}** ✓

Ref Text

Reports; ER959.02 - Load Test

Drawings;

95910, 0, Cargo Basket Assy, See item 8, 95916-01, Fwd Sheet

95911, 0, Basket Fabrication, 4130 GTAW

95912, 0, Basket Lid Assy, 4130 GTAW

95920, 0, Fwd Fitting Fab [Billet Machined Part]

95921, 0, Aft Fitting Fab [Billet Machined Part]

95930, 0, Fwd Beam Fab, 304SS GTAW

95931, 0, Aft Beam Fab, 304SS GTAW

ER959.02 Rev 0, 6 Sept 12, Quick Release Cargo Basket

Load Test Report, Approved by; DAR 290M **Done {Good}** ✓

Ref Text

Reports; ER959.01 - Compliance

Drawings; 95910, 95911, 95912, 95930, 95931

As above.

Installation Drawings; **{As reviewed drafts & with DAR added info noted.}**

95905 - Need a copy **emailed** {0draft_QR.Cargo.Basket.Install_LH-RH }

95906 - Need a copy **emailed** {0draft_QR.Basket.LH-RH.Mnt.Provisions }

95907 - Need a copy **emailed** {0draft_QR.Attach.(Pin).Install }

Fabrication Drawings; {As reviewed drafts & with DAR added info noted.}

95912 95962- Need a copy emailed {I can't find this file} None.

95932 - Need a copy emailed {0DRAFT_QR.Beam.Fwd.Fab}

95933 - Need a copy emailed {0S1DRAFT_QR.Beam.Aft.Fab & 0S2DRAFT_QR.Beam.Aft.Fab}

95940 referenced in TR959.04 - Need a copy emailed {0draft_QR.Lugs.Fab}

95950 - Need a copy emailed {0DRAFT_QR.Basket.Assy}

95951 - Need a copy emailed {0draft_QR.Basket.Fab}

{95952_0draft_QR.Lid.Assy.(Fab), This looks more like a fabrication drawing?}

{95964_0draft_QR.Fwd.Attach.Looping.(Fab)}

{95965_0DRAFT_QR.Fwd.Sht.(Carbon.Layup_SI959.95-0)}

{95966_0S1DRAFT_QR.Filler.Sht.(Carbon.Layup_SI959.95-0)}

{95967_0draft_QR.Lid.Sht.(Carbon.Layup_SI959.95-0)}

{SI959.95_0draft_QR.Carbon.Layup.Procedures}

{SI Review:

Title; Carbon/Kevlar/Glass Composite Panel Layup Procedures

After the Reference Text section add an Attachments section and include the product guides and the data sheets that were originally noted in the Ref Text section. i.e.; is this all of the required info for the fabricator?

Would it help to reference the applicable Bell SPM sections?

Because you should consider/address:

- Safety procedures/requirements/protection etc..
- **Post cure inspection requirements.**
- Shop Q/A requirements and procedures.
 - Mold/plate inspection should be at the start of each procedure.
 - Material care and storage.
 - Material control and sign-out requirements.
 - Shop traveller sheets.
 - etc.
- This must be a TC approved composite shop? → no
- ?

material procured
throughout AMF system
Inspection by our AME
final release comes
from our AMF

Make a Required Tooling section and include the mold numbers

Please supply the mold drawings.

I believe that they should be included in the MDL.

Hand tools per the SPM?

3.0 BoC

Okay {Not okay. BOC should not be buried in this loads type document.}

{If shown this should be referenced back to the fundamental BOC requirements noted in the Cert Plan where the BOC is approved/accepted by TCCA. i.e.; Please add the BOC to the Cert Plan.

Please remove the "This report demonstrates...." note.} ✓

4.0 Applicability of ADs

Similar note included in the original ER959.01_0 (?) This was a requirement from Calgary/Edmonton TC office, we were required to have it in the report since at least 2001 when I started, it was not in the project description up front.

Okay

{Not okay. An AD search/statement should not be buried in this loads type document. Please put it in the Cert Plan for TC acceptance.}

Page 4

5.0 Loads

Okay

Page 5

5.1 Inertia Loads

Okay

5.2 Drag Loads

Most other DARs cannot approve non-published load values.

Include "no change" or "delta" comments. Done {Good. Is there an updated CP available?}

Page 6

5.2 Drag Loads continued

368 lbf in the aft direction [vs. 1532 lbf up from the lid.] Lid load changed

{Some big changes! [for the better]}

Can you please provide at least one space between the values and the units?

i.e.; 1021lbf = 1021 lbf} Mathcad → best I can do is - 1021 lbf

5.3 Lid Loads [vs. ER959.01_0 5.3 Attachment Fitting Loads]

This is new (Yes for change)

Please up-date;

CP959-1_0 527.301 Loads - Air Drag Loads for FOC by DOT. Done

{Good. Is there an updated CP available?}

How does the CP numbering work? Version - Revision???

Because the last approved CP was CP959 Rev 2 and the current CP is CP959-1 [Rev 0 ???]

I did not continue the previous CP959 Rev.2 (CP959_2) to Rev 3 because I wanted a clear distinction between the new configuration and old, so went to CP959-1.

{Very good.}

Show units in the required equations units. i.e.; Done {Thanks.}

Area $A_{xx} = XX \text{ in}^2 = YY \text{ ft}^2$

Velocity $V_{xx} = XX \text{ knots} = YY \text{ fps}$

etc.

"continuous (non-perforated) sheet" section not "solid"

or a better description and please include the "delta" change info. Done

is the drag vertical (down wash) or some combination? Up and down, climb and descent

5.3.1 Cargo

must support this "distributed" load. **Done**

{Page 8.

5.5.1, Last sentence change to read "The composite carbon fiber lid will be tested to structural demonstrate compliance."}

$$\{P \text{ cargo} = 300 \text{ lbs} \times 1 \text{ g} \times 1.5 \text{ FoS} = 450 \text{ lbs}$$

$$P \text{ test} = 450 \text{ lbs} \times 1.5 \text{ nvf} \times 1.X \text{ nkd} = XXX \text{ lbs}\}$$

5.3.2 Airflow

Where is the info showing that auto-rotation is higher than the best rate of climb? wrt weights, performance, angles, combined loading, up/dwn directions?

There are vert & horz vectors wrt both climb & auto-rotation.

i.e.; qualify this "most conservative" applied vertical load on the lid. **Done**

Page 7

5.3.2 Airflow continued

Again show equation type units. **Done**

$$\{\text{Page 9. } V_{\text{max_roc}} = 4350 \text{ ft/min} = 43 \text{ knots} = 72.5 \text{ ft/s}\}$$

$$\{\text{Page 10. } V_{\text{max_desc}} = 6000 \text{ ft/min} = 59.2 \text{ knots} = 100 \text{ ft/s}\}$$

$$\{\text{and again } 811 \text{ lbf} = 811 \text{ lbf}\}$$

1532 lbf ult up for "auto-rotation" drag vs. 563 lbf ult up for -1.5g ult inertia???? **Changed to vertical speeds {Okay}**

{Page 10

5.5.3 Personnel}

$$\{P \text{ person ult} = 200 \text{ lbs} \times 2 \text{ g} = 400 \text{ lbs over } 6" \times 12" \text{ footprint}$$

$$P \text{ test} = 400 \text{ lgs lbs} \times 1.5 \text{ nvf} \times 1.X \text{ nkd} = XXX \text{ lbs } \}$$

5.4 Attachment Fitting Loads

The attachment beam design resolves the Basket Loads into fwd-aft, side & vertical loads at the basket side fitting and vertical only (?) at the opposite side???

The basket side uses plates that can transfer all of the fwd-aft, side, and vertical loads (but no moment) to the airframe, the opposite side is a linkage arrangement that cannot transfer a lateral load or moment, so only vertical and fwd-aft can be carried at that point. **{Okay}**

Please show/id as x, y & z vectors per the convention for this aircraft on a 2D - 4 (front views of fwd & aft beams) view free body diagram (FBD) with reference Sta's, BL's & WL's. **Done**

Load Location Assumptions

WRT EC959.01_0.pdf;

a) What happened to the standard width basket option?

b) What happened to the short basket option?

The original proposal to Bell was to use our existing B407 baskets (3 different sizes) with no changes to the basket assembly and to allow any of them to be used. As it turned out, the 96" option made the most sense but required modification from the B407 configuration so none of the B407 baskets can be used.

Figure 5.4.1 - Load Locations

[Load and Reaction Locations, BLs only.]

Why does the LHS of the Fwd/Aft Beams extend so far out the opposite side? Steps mnts? **Yes, and steps are mandatory.**

This is one of the required 4 2D views. **Done**

[527.807 Emergency Exits

Noted in CP959-1_0 as "No" Change from CP Rev. 2 and "N/A, Installation does not block doors."

Same note was included in the last CP959_2.pdf, REV. No. 2 22]

Please include door opening info where if the doors can be obstructed by a deformed the Basket and there should be a note about the generous ground clearance.

Do the doors have any emergency exit provisions?

If so please provide copies of the applicable Bell document pages and include some comments in the ER.

[I have noted that a lot of the above info was included in earlier reports and it would to good to note this "per report 959-XX" type references.]

Added this to the report in Section 7.0, emailed IPB for mod kit.

{Okay.} ✓

Aft Support Beam Reactions

Vertical Wts $(75 + 300) * 3.5 * 1.5 = 1969 \text{ lbf}$ vs. **Lid @ 1532 lbf** **Changed**

The FBDs will help show what's happening.

~~Please include shear and moment diagrams for each beam. N/A~~

~~Where is the combined loading; aft drag plus vertical g load? Combined per~~

Load testing

Aft Support Beam Reactions continued

Assumes????

Aren't these exact calculations?

[40/60 is a more typical assumption.]

Point taken, number used is at CofG of beam {Okay} ✓

Forward Support Beam Reactions

Where is the combined loading; aft drag plus vertical g load or??? **Done, aft beam is critical. {Okay} ✓**

Forward Support Beam Reactions continued

Assumes????

Aren't these exact calculations?

Number used is at CofG of beam {Okay, Did my own calc.} ✓

Drag Load

Support Beam Reactions

Assuming the basket is rigid how is the loading shared equally?

Description inserted: The basket is rigid (does not deform or twist between attachments with the drag load applied), and the mounting beams can deflect sufficiently without yielding (0.13 inches) to allow the basket attachments to bottom-out in the horizontal keyways, therefore the drag load is shared equally between the front and rear mounting beams.

are there washers or shims for a close fit? No {Okay} ✓

diagram? Done {Okay} ✓

2-D FBD's???? Done {Okay} ✓

Page 11

6.0 Structural Compliance

6.1 Cargo Basket

By test. Refer to ER959.02

Are these aft horz + dwn vert = combined load tests? **YES**

Original tests completed with the lid open!

Lid by test. Refer to TR959.05

dwn vert drag? **YES**

Static load tests pending.

Is the step test a hard requirement via general design??

Better wording?? Not a hard requirement, prudent check for something that may occur in service. Changed wording in load section.

Brief Review of TR959.05_0draft1.pdf

2.0 Reference Text

Include document rev/date, titles, descriptions and "delta" type notes. Done

6.2 Mounting Beams

By test. Refer to ER959.02

Are these aft horz + dwn vert = combined load tests? **YES**

Original tests completed with scrap beam sections. No, conforming parts

What are the load sharing details???

i.e.; what are the design features???

{Page 16.

6.2.2 Air Flow Load Condition

Why discuss the Lid down force of 313 lbs vs. the 1960 lbs test load? *Removed*

The 811 lb value does not include the 1.5 nvf factor. → *it does in limit load*

You have 811 lbs up vs. tested values of 560 lbs up and 1960 lbs dwn.

Can you make a symmetry assessment of the beam structure?}

6.3 Attachment Fittings

By test. Refer to TR959.04

Are these aft horz + dwn vert = combined load tests? YES

6.4 Helicopter Attachment Points

Data from Bell

Are these aft horz + dwn vert = combined load tests? Yes

{Page 16. 6.5? Composite Lid
Lid test plans and values??}

Page 12

Blank

Page 13

Appendix A

Title and balance of page Blank? [Email from Bell](#)

Page 14

Blank [Email from Bell](#)

Page 15

Appendix B

Title and balance of page Blank? [May not be needed](#)

Page 16

Blank

CHAPTER 3 MISCELLANEOUS GUIDANCE (MG)

AC 27 MG 8. (Amendment 27-30) SUBSTANTIATION OF COMPOSITE ROTORCRAFT STRUCTURE

a. Reference FAR Sections §§ 27.305, .307, .571, .603, .605, .609, .610, .611, .613, .629, .923, .927, .931, .1529 and Appendix A.

b. Purpose. These substantiation procedures provide a more specialized supplement to the general procedures outlined by AC 20-107A, "Composite Aircraft Structure." These procedures address substantiation requirements for composite material system constituents, composite material systems, and composite structures common to rotorcraft. A uniform approach to composite structural substantiation is desirable, but it is recognized that in a continually developing technical area which has diverse industrial roots, both in aerospace and in other industries, some variations and deviations from the procedures described herein will be both necessary and acceptable. Significant deviations from this material should be coordinated in advance with the Rotorcraft Directorate.

c. Special Considerations. Since rotorcraft structure is configured uniquely and is inherently subjected to severe cyclic stresses, special consideration is required for the substantiation of all rotorcraft structure, including composites. This special consideration is necessary to ensure that the level of safety intended by the current regulations is attained during the type certification process for all structure with special emphasis on composite structure because of its unique structural characteristics, manufacturing quality and operational considerations, and failure mechanisms.

d. Background.

(1) Historically, rotorcraft have required unique, conservative structural substantiation because of unique configuration effects, unique loading considerations, severe fatigue spectrum effects, and the specialized comprehensive fatigue testing required by these effects. Rotorcraft structural static strength substantiation for both metal and composite structure is essentially identical to that for fixed wing structure once basic loads have been determined. However, rotorcraft structural fatigue substantiation for metals is significantly different from fixed wing fatigue substantiation. Since AC 20-107A, as developed, applies to both fixed wing aircraft and rotorcraft; it, of necessity, was finalized in a broad generic form. Accordingly, a need to supplement AC 20-107A for rotorcraft was recognized during type certification programs. One significant difference in traditional rotorcraft fatigue substantiation programs and fixed wing fatigue programs is the use of multiple full-scale specimen fatigue tests for rotorcraft programs rather than just one full-scale specimen test. Also, constant amplitude, accelerated load tests are typically used rather than spectrum tests because of the high frequency loads common to rotorcraft operations. These rotorcraft fatigue

tests have traditionally involved the generation of stress versus life or cycle (S-N) curves for each critical part (most of which are subjected to the cyclic loading of the main or tail rotor system) using a monotonic (sinusoidal) fatigue spectrum based on maximum and minimum service stress values. Unless configuration differences or flight usage data dictate otherwise, the monotonic fatigue spectrum's period is typically based on six ground-air-ground (GAG) cycles for each flight hour of operation. The S-N curves for the substantiation of each detailed part are typically generated by plotting a curved line through three data points (reference AC 29-2C, paragraph AC 29 MG 11, "Fatigue Evaluation of Transport Category Rotorcraft Structure (Including Flaw Tolerance)"). The three data points selected are a short specimen life (low cycle fatigue), an intermediate specimen life and a long specimen life (high cycle fatigue). Each raw data point is generated by monotonically fatigue testing at least two full-scale specimens (parts) to failure or run out for each data point on the S-N curve. The raw data point values are then reduced by an acceptable statistical method to a single value for plotting to ensure proper reliability of the associated S-N curve. Order 8110.9, "Handbook on Vibration Substantiation and Fatigue Evaluation of Helicopter and Other Power Transmission Systems" and paragraph AC 29 MG 11 of AC 29-2C contain comprehensive discussions of the S-N curve generation process. The rotorcraft S-N curve process contrasts sharply with the fixed wing process of using a single full-scale fatigue article (usually an entire wing or airframe, which constitutes a single full-scale assembly data point), generic material or full-scale assembly S-N data (e.g., MIL-HDBK-5 for metals, MIL-HDBK-17 for composites, or AFS-120-73-2 for full-scale assemblies), a non-monotonic spectrum and relatively large scatter factors to verify or determine the design fatigue life of the full-scale airplane.

(2) Also, rotorcraft have employed and mass produced composite designs in primary structure (typically main and tail rotor blades) since the early 1950's. This was 10 or more years before composites were type certificated for primary fixed-wing structure in either military or civil aircraft applications (with some notable limited production exceptions, such as the Windecker fixed wing aircraft). In any case, the early 1950 period was well before a clear, detailed understanding of composite structural behavior (especially in the areas of macroscopic and microscopic failure mechanisms and modes) was relatively common and readily available in a usable format for the average engineer working in this field. It also predated the initial issuance of AC 20-107. Currently, much composite design information is proprietary, either to government, industry or both, and many data gathering methods have not been completely standardized. Consequently, a significant variation from laboratory to laboratory in material property value determination methods and results can exist. The early rotor blade designs (as well as current designs) are by nature relatively low strain, tension structure designs. Also, by nature, these designs are not damage or flaw critical. Thus by circumstance as much as design, early composite rotor blade and other composite rotorcraft designs incorporated an acceptable fatigue tolerance level of safety. In the 1980's, more test data, analytical knowledge, and analytical methodology became available to more completely substantiate a composite design. Current FAR's 27 and 29 contain many sections (reference paragraph a.) to be considered in substantiating composite rotorcraft structure, but this advisory material is needed to

supplement the general guidance of AC 20-107A by providing specific rotorcraft guidance for obtaining consistent compliance with FAR sections applicable to rotorcraft.

e. Definitions. The following basic definitions are provided as a convenient reading reference. MIL-HDBK-17, and other sources, contain more complete glossaries of definitions.

(1) AUTOCLAVE. A closed apparatus usually equipped with variable conditions of vacuum, pressure and temperature. Used for bonding, compressing or curing materials.

(2) ALLOWABLES. Both A- basis and B- basis values statistically derived and used for a particular composite design.

(3) BALANCED LAMINATE. A composite laminate in which all laminae at angles other than 0° occur only in \pm pairs (not necessarily adjacent).

(4) A-BASIS ALLOWABLE. The "A" mechanical property value is the value above which at least 99 percent of the population of values is expected to fall, with a confidence of 95 percent.

(5) B-BASIS ALLOWABLE. The "B" mechanical property value is the value above which at least 90 percent of the population of values is expected to fall, with a confidence of 95 percent.

(6) BOND. The adhesion of one surface to another, with or without the use of an adhesive as a bonding agent.

(7) COCURE. The process of curing several different materials in a single step. Examples include the curing of various compatible resin system pre-pregs, using the same cure cycle, to produce hybrid composite structure or the curing of compatible composite materials and structural adhesives, using the same cure cycle, to produce sandwich structure or skins with integrally molded fittings.

(8) CURE. To change the properties of a thermosetting resin irreversibly by chemical reaction; i.e., condensation, ring closure, or addition. Cure may be accomplished by addition of curing (crosslinking) agents, with or without catalyst, and with or without heat.

(9) DELAMINATION. The separation of the layers of material in a laminate.

(10) DISBOND. A lack of proper adhesion in a bonded joint. This may be local or may cover a majority of the bond area. It may occur at any time in the cure or subsequent life of the bond area and may arise from a wide variety of causes.

(11) FIBER. A single homogeneous strand of material, essentially one--dimensional in the macro-behavior sense, used as a principal constituent in advanced composites because of its high axial strength and modulus.

(12) FIBER VOLUME. The volume of fiber present in the composite. This is usually expressed as a percentage volume fraction or weight fraction of the composite.

(13) FILL. The 90° yarns in a fabric, also called the woof or weft.

(14) GLASS TRANSITION. The reversible change in an amorphous polymer or in amorphous regions of a partially crystalline polymer from (or to) a viscous or rubbery condition to (or from) a hard and relatively brittle one.

(15) GLASS TRANSITION TEMPERATURE. The approximate midpoint of the temperature range over which the glass transition takes place.

(16) HYBRID. Any mixture of fiber types (i.e., graphite and glass).

(17) IMPREGNATE. An application of resin onto fibers or fabrics by several processes: hot melt, solution coat, or hand lay-up.

(18) LAMINA. A single ply or layer in a laminate in which all fibers have the same fiber orientation.

(19) LAMINATE. A product made by bonding together two or more layers or laminae of material or materials.

(20) LOW STRAIN LEVEL. As used herein, is defined as a principal, elastic axial gross strain level, that for a given composite structure provides for no flaw growth and thus provides damage tolerance of the maximum defects allowed during the certification process using the approved design fatigue spectrum.

(21) MATERIAL SYSTEM CONSTITUENT. A single constituent (ingredient) chosen for a material system (e.g., a fiber, a resin).

(22) MATERIAL SYSTEM. The combination of single constituents chosen (e.g., fiber and resin).

(23) MATRIX. The essentially homogeneous material in which the fibers or filaments of a composite are embedded. The resins used in most aircraft structure are thermoset polymers.

(24) MAXIMUM STRUCTURAL TEMPERATURE. The temperature of a part, panel or structural element due to service parameters such as incident heat fluxes, temperature, and air flow at the time of occurrence of any critical load case, (i.e., each

critical load case has an associated maximum structural temperature). This term is synonymous with the term "maximum panel temperature."

(25) POROSITY. A condition of trapped pockets of air, gas, or void within a solid materials, usually expressed as a percentage of the total nonsolid volume to the total volume (solid + nonsolid) of a unit quantity of material.

(26) PRE-PREG, PREIMPREGNATED. A combination of mat, fabric, nonwoven material, tape, or roving already impregnated with resin, usually partially cured, and ready for manufacturing use in a final product which will involve complete curing. Prepreg is usually drapable, tacky and can be easily handled.

(27) RESIN. An organic material with indefinite and usually high molecular weight and no sharp melting point.

(28) RESIN CONTENT. The amount of matrix present in a composite either by percent weight or percent volume.

(29) SECONDARY BONDING. The joining together, by the process of adhesive bonding, of two or more already-cured composite parts, during which the only chemical or thermal reaction occurring is the curing of the adhesive itself. The joining together of one already-cured composite part to an uncured composite part, through the curing of the resin of the uncured part, is also considered for the purposes of this advisory circular to be a secondary bonding operation (See COCURING).

(30) SHELF LIFE. The length of time a material, substance, product, or reagent can be stored under specified environmental conditions and continue to meet all applicable specification requirements and/or remain suitable for its intended function.

(31) STRAIN LEVEL. As used herein, is defined as the principal axial gross strain of a part or component due to the principal load or combinations of loads applied by a critical load case considered in the structural analysis (e.g., tension, bending, bending-tension, etc.). Strain level is generally measured in thousandths of an inch per unit inch of part or microinches/per inch (e.g., .003 in/in equals 3000 microinches/inch).

(32) SYMMETRICAL LAMINATE. A composite laminate in which the ply orientation is symmetrical about the laminate midplane.

(33) TAPE. Hot melt impregnated fibers forming unidirectional pre-preg.

(34) THERMOPLASTIC. A plastic that repeatedly can be softened by heating and hardened by cooling through a temperature range characteristic of the plastic, and when in the softened stage, can be shaped by flow into articles by molding or extrusion.

(35) THERMOSET (OR CHEMSET). A plastic that once set or molded cannot be re-set or remolded because it undergoes a chemical change; (i.e., it is substantially infusible and insoluble after having been cured by heat or other means).

(36) WARP. Yarns extended along the length of the fabric (in the 0° direction) and being crossed by the fill yarns (90° fibers).

(37) WORK LIFE. The period during which a compound, after mixing with a catalyst, solvent, or other compounding constituents, remains suitable for its intended use.

f. RELATED REGULATORY AND GUIDANCE MATERIAL.

<u>Document</u>	<u>Title</u>
(1) AC 27 MG 11	"Fatigue Evaluation of Rotorcraft Structure"
(2) AC 20-107	"Composite Aircraft Structure"
(3) AC 21-26	"Quality Control for the Manufacture of Composite Materials"
(4) MIL-HDBK-17	"Polymer Matrix Composites Volume 1: Guidelines"

g. PROCEDURES FOR SUBSTANTIATION OF ROTORCRAFT COMPOSITE STRUCTURE. The composite structures evaluation has been divided into eight basic regulatory areas to provide focus on relevant regulatory requirements. These eight areas are: (1) fabrication requirements; (2) basic constituent, pre-preg and laminate material acceptance requirements and material property determination requirements; (3) protection of structure; (4) lightning protection; (5) static strength evaluation; (6) damage tolerance and fatigue evaluation; (7) dynamic loading and response evaluation; and (8) special repair and continued airworthiness requirements. Original as well as alternate or substitute material system constituents (e.g., fibers, resins, etc.), material systems (combinations of constituents and adhesives), and composite designs (laminates, cocured assemblies, bonded assemblies, etc.) should be qualified in accordance with the methodology presented in the following paragraphs. Each regulatory area will be addressed in turn. It is important to remember that proper certification of a composite structure is an incremental, building block process which involves phased FAA/AUTHORITY involvement and incremental approval in each of the various areas outlined herein. It is strongly recommended that a FAA/AUTHORITY certification team approach be used for composite structural substantiation. The team should consist of FAA/AUTHORITY engineering, the MIDO inspector(s), the associated Designated Engineering Representatives (DER's), the associated Designated Manufacturing Inspection Representatives (DMIR's), and cognizant members of the

applicant's organization. Personnel who are composites specialists (or are otherwise knowledgeable in the subject) should be primary team member candidates. Once selected, it is recommended that team meetings be held periodically (possibly in conjunction with type boards) during certification to ensure the building block certification process is accomplished as intended.

(1) The first area is the fabrication requirements of § 27.605:

(i) The quality control system should be developed considering the critical engineering, manufacturing, and quality requirements and a guidance standard such as AC 21-26, "Quality Control For the Manufacture of Composite Materials." This ensures that all special engineering, or manufacturing quality instructions for composites are presented, evaluated, documented, and approved, using drawings, process and manufacturing specifications, standards, or other equivalent means. This should be one of the early phases of a composite structure certification program, since this represents a major building block for sequential substantiation work.

(ii) Specific allowable defect limits on, for example, fiber waviness, warp defects, fill defects, porosity, hole edge effects, edge defects, resin content, large area debonds, and delaminations, etc., for a particular material system component, laminate design, detailed part, or assembly should be jointly established by engineering, manufacturing, and quality and the associated inspection programs for defect detection created, validated, and approved. Each critical engineering design should consider the worse-case effects of the manufacturing process (maximum waviness, disbonds, delaminations, and other critical defects) allowed by the reliability limitations of the approved inspection program.

(iii) If bonds or bond lines such as those typical of rotorcraft rotor blade structure are used, special inspection methods, special fabrication methods or other approved verification methods (e.g., engineering proof tests, reference paragraph g(5)) should be provided to detect and limit disbonds or understrength bonds.

(iv) Structurally critical composite construction fabrication process and procurement specifications, for fabricating reproducible and reliable structure, must be provided and FAA/AUTHORITY approved early during the certification process and should, as a minimum, cover the following:

(A) Vendor and Qualified Parts List (QPL) Control. Applicants should be able to demonstrate to FAA/AUTHORITY certification team members (both the manufacturing and inspection district office (MIDO) and FAA/AUTHORITY engineering) at any time, that their quality control systems ensure on a continuous basis, that only qualified suppliers provide the basic material constituents or material systems (e.g., pre-pregs) that meet approved material specifications. Recommended guidelines for qualification of alternate material systems and suppliers are contained in MIL-HDBK-17B, Volume I, Section 2.3.2.

These methods can also be used, periodically for qualification status renewals of existing material systems and suppliers.

(B) Receiving Inspection and In Process Inspection. Applicants should be able to demonstrate to FAA/AUTHORITY certification team members (both MIDO and engineering), at any time, that their receiving and in-process quality control systems provide products which continuously meet approved material and process specifications. Quality systems should be designed with appropriate checks and balances, such that the necessary statistical reliability and confidence levels for the items being inspected (that are specified by engineering) are continuously maintained. This will require periodic standard inspections and engineering characterization tests on basic constituent and material system samples which should be conducted, as a minimum, on a batch-to-batch basis. The periodic testing necessary to maintain the quality standard should be conducted by the applicants on conformed samples and should be FAA/AUTHORITY-witnessed.

(C) Material System Component Storage and Handling. Applicants should be able to demonstrate to FAA/AUTHORITY certification team members (both MIDO and engineering), at any time, that their composite material system (or constituent) storage and handling procedures and specifications provide products which continuously meet approved material and process specifications. Quality systems should be designed with appropriate checks and balances, such that the necessary statistical reliability and confidence levels for the items being inspected (which are specified by engineering) are continuously maintained. This should require, as a minimum, periodic inspections to ensure that proper records are kept on critical parameters (e.g., room temperature "bench" exposure, shelf life, etc.) and that periodic basic constituent and material system characterization tests are conducted, on a batch-to-batch basis. The periodic testing necessary to maintain the quality standard should be conducted by the applicants on conformed samples and should be FAA/AUTHORITY-witnessed.

(D) Statistical Validation Level. It is necessary to maintain the minimum required statistical validation level of the quality control system (which should be specified for each critical item or constituent by the approved quality and engineering specifications). The statistical validation level should be defined and approved early in certification. Also, approval and proper usage should be continuously maintained during the entire procurement and manufacturing cycles.

(v) Alternate fabrication and process techniques should be approved and should comply with § 27.605. Any alternate techniques should provide at least the same level of quality and safety as the original technique. Any changes should be presented and FAA/AUTHORITY-approved well in advance of the change's production effectivity.

(2) The second area is the basic raw constituent, pre-preg, and laminate material acceptance requirements and material property determination requirements of

§§ 27.603 and 27.613. These criteria require application of the critical environmental limits such as temperature, humidity, and exposure to aircraft fluids (such as fuel, oils, and hydraulic fluids), to determine their effect on the performance of each composite material system. Temperature and humidity effects are commonly considered by coupon and component tests utilizing preconditioned test specimens for each material system selected. Material "A" & "B" basis allowable strength values and other basic material properties (based on MIL-HDBK-17, or equivalent) are typically determined by small scale tests, such as coupon tests, for use in certification work. In the case of composites, determination of these basic constituent and material system properties will almost invariably involve the submittal, acceptance and use of company standards. This is currently necessary because MIL-HDBK-17 has not completed development of "B" basis allowables for inclusion in the handbook. Also, test methods vary somewhat from manufacturer to manufacturer; therefore, individual company results will exhibit some scatter in final material property values. Any company standard which is approved and used should meet or exceed related MIL-HDBK-17 requirements. Material structural acceptance criteria and property determination should, as a minimum, include the following:

(i) Property characterization requirements of all material systems (e.g., pre-pregs, adhesives, etc.) and constituents (e.g., fibers, resins, etc.) should be identified, documented, and approved. These requirements, once approved, should be placed in all appropriate procedures and specifications (such as those in g(1) above).

(ii) Moisture conditioning of test coupons, parts, subassemblies, or assemblies should be accomplished in accordance with MIL-HDBK-17, other similar approved methods or per FAA/AUTHORITY approved programs.

(iii) The maximum and minimum temperatures expected in service (as derived from test measurements, thermal analyses on panels and other parts, experience, or a combination) should be determined and accounted for in static and fatigue strength (including damage tolerance) substantiation programs considering associated humidity induced effects.

(iv) The glass transition temperature, T_g , is an important characteristic parameter of amorphous polymers, such as epoxies. It is the temperature below which the polymer behaves like a "glassy" solid and above which it behaves like a "rubbery" solid, i.e., it is the temperature at which there is a very rapid change in physical properties. In actuality, the change from a hard polymeric material to a rubbery material takes place over a narrow temperature range. A composite material will experience a drastic reduction in matrix controlled mechanical material properties when loaded in this temperature range. Since the resin (matrix) is the critical structural constituent in a composite and since T_g exceedance is critical to structural integrity; T_g determination is necessary. The T_g margin methodology of MIL-HDBK-17, Section 2.2.2.1, should be implemented, i.e., the wet glass transition temperature (T_g) should be 50° F higher than the maximum structural temperature (see definition). For any type of resin or adhesive, an acceptable temperature margin using MIL-HDBK-17 techniques (e.g., consideration

of limited high temperature excursions) or equivalent methodologies based on tests and/or experience should be established and approved early in the certification process. In no case should structural strength be degraded below limit load capability on a maximum world wide high temperature day.

(v) Local design values should be established by analysis and characterization tests and approved for specific structural configurations (point designs) which include the effects of stress risers (e.g., holes, notches, etc.) and structural discontinuities (e.g., joints, splices, etc.). Proper determination of these values for full-scale design and test should be considered one of the most critical building blocks in substantiating and evaluating a composite structure. These transitional load transfer areas typically produce the highest stresses (and strains) and serve as the nucleation sites for many of the failures (including those due to the relatively low interlaminar strength of composites) that occur in service in a full-scale part or assembly. Small scales tests (such as coupon, element, and subcomponent tests), or equivalent approved testing programs, and analytical techniques should be carefully designed, prepared, and approved to evaluate potential "hot spots" and provide accurate simulations and representations of full-scale article stresses and strains in the critical transition areas. Proper certification work in this area will ensure initial safety and continued airworthiness in full-scale production articles.

(vi) The design strain level for each major component and material system should be established and approved such that specified impact damage considerations are defined and properly limited. The effects of the approved strain levels should be established for each composite material using small scale characterization tests and the results should be used to establish or verify the maximum allowable design strain level for each full-scale article. The maximum allowable design strain values selected should also take into account the reliability and confidence levels established for the relevant portions of the quality control system. This methodology is necessary because the amount and size of flaws in the production article may restrict the allowable level of design strain. In a no-flaw-growth design, the maximum specified impact damage and manufacturing flaw size at the most critical location on the part will be a major factor in determining the maximum allowable elastic strain. This design approach is currently selected for nearly all civil and most military applications; since, under normal conditions, only visual inspections are required in the field (unless unusual external damage circumstances such as a hail storm occur) to maintain the initial level of airworthiness (safety). However, many military applications because of their demanding missions, employ scheduled field non-destructive inspection (NDI) maintenance, (such as comparative ultrasonics) to ensure that flaw growth either does not occur, is controlled by approved structural repair, or by replacement of affected parts. To date, civil applications have not been presented that desire a flaw growth, phased NDI approach. Therefore, selection of the full-scale article's design strain limit based on small scale tests for a no flaw growth design is seen to be extremely important.

(vii) Composite and adhesive properties should be determined such that detrimental structural creep does not occur under the sustained loads and environments

expected in service. Small scale characterization tests (such as coupon, element, and subcomponent tests) and analysis, which verify and establish the full-scale design criteria and parameters necessary to ensure that detrimental structural creep in full-scale structure does not occur in service, should be conducted early in certification and should be FAA/AUTHORITY-approved.

(viii) Material allowable strength values for full-scale design and testing should be developed using the coupon procedures presented in MIL-HDBK-17 or equivalent. At least three batches of material samples should be used in material allowable strength testing. Company standards should be prepared, evaluated and FAA/AUTHORITY approved early in certification (as part of the building block process), that reflect the material property determination considerations recommended in MIL-HDBK-17 on a equal to or better than basis.

(3) The third area is the protection of structure as required by § 27.609. Protection against thermal and humidity effects and other environmental effects (e.g., weathering, abrasion, fretting, hail, ultraviolet radiation, chemical effects, accidental damage, etc.) should be provided, or the structural substantiation should consider the results of those effects for which total protection is impractical. Determination and approval of worst-case or most conservative operating limits, and damage scenarios should be accomplished. Appropriate flammability and fire resistance requirements should also be considered in selecting and protecting composite structure. Usually a hazard analysis is conducted early in certification which identifies the various threats and threat levels for which protection must be provided. This data is then used to construct and submit for approval the methods-of-compliance necessary to provide proper structural protection.

(4) The fourth area is the lightning protection requirements of § 27.610. Protection should be provided and substantiated in accordance with analysis and with tests such as those of AC 20-53A and FAA Report DOT/FAA/CT-86/8. For composite structure projects involving rotorcraft certified to earlier certification bases (which do not automatically include the lightning protection requirements of § 27.610), these requirements should be imposed as special conditions. The design should be reviewed early in certification to ensure proper protection is present. The substantiation test program should also be established, reviewed and approved early to ensure proper substantiation.

(5) The fifth area is the static strength evaluation requirements of §§ 27.305 and 27.307 for composite structure. Only conservative proven methods of static analysis and failure criteria should be employed. The material stress-strain curve should be clearly established, at least through the ultimate design load, for each composite design. Composite structure should be statistically demonstrated, incrementally, through a program of analysis, coupon tests, minor component ultimate load tests and major component ultimate load tests. The static strength substantiation program should consider all critical loading conditions for all critical structure including residual strength and stiffness requirements after a predetermined length of service,

e.g., end of life (EOL) (which takes into account damage and other degradation due to the service period). Analytical reports and tests should consider all possible failure modes and should include the critical, allowable effects of:

- (i) Environment (reference g(2) and (3) of this AC paragraph.)
- (ii) Service Life (residual limit strength and stiffness demonstration.)
- (iii) Load path loss (fail-safe analysis and limit strength demonstration.)
- (iv) The standard fabrication process and its variability.
- (v) Impact damage expected during service up to the established threshold of detectability of the field inspection methods to be employed.
- (vi) Point design and structural discontinuity considerations (e.g., stress risers, joints, etc.)

(vii) Unless the ultimate strength of each critical bonded joint can be reliably substantiated in production by NDI techniques (or other equivalent, approved techniques), then limit load capability is guaranteed by either of the following or a combination thereof:

(A) The maximum disbond of each critical bonded joint which will carry limit load is established by test, analysis, or both. Disbonds greater than these values are typically prevented by design features.

(B) Each critical bonded joint on each production article should be proof tested to the critical limit load.

(viii) For static strength analysis laminae and laminate "A" and "B" basis allowables (determined in accordance with g(2) of this AC paragraph) should be used subject to the following conditions unless lower material properties are required by point design considerations (e.g., stress risers, joints, etc.) stiffness requirements (e.g., flutter or vibration margins), fatigue strength (including damage tolerance), or other overriding considerations.

(A) When applied loads are distributed through a single load path or single member within an assembly, the failure of which would result in the loss of the structural integrity of the component involved or inability of the rotorcraft structure to carry limit load, the part should be designed, analyzed, and tested using "A" basis allowables.

(B) Redundant (fail-safe) structures in which the failure of individual elements would result in applied loads being safely redistributed to other load carrying

members without exceeding the limit load capability of the rotorcraft structure may be designed, analyzed, and tested using "B" basis allowables.

(6) The sixth area is the fatigue evaluation requirements of § 27.571. The fatigue evaluation method for the rotorcraft being certified should consider damage tolerance in accordance with AC 20-107A.

(i) The safe-life method for composite structure as defined in AC 20-107A is a flaw tolerant safe-life method (e.g., the test specimens consider inherent production flaws and impact damage (reference g(7)(ii) of this AC paragraph).

(ii) Large area disbonds, weak bonds, delaminations, or other defects should be considered in tests or be prevented or be limited by appropriate flaw tolerant special design features and by special manufacturing, maintenance, and inspection procedures. Special attention should be assigned to all pure bond lines (reference g(5) of this AC paragraph).

(iii) Non-fail-safe or partially fail-safe dynamic component structure, which may employ bond lines as the only load path, should be designed to relatively small previously approved values of elastic, ultimate strain for the material system utilized, and should be subjected to full-scale S-N curve testing. Six or more specimens are recommended, as part of the substantiation process. Where practical, flight-by-flight spectrum testing should be used.

(iv) All critical safety of flight composite structure must be designed to be flaw (damage) tolerant. Environment degradation and in-service damage critical values are typically included in the flaw tolerance evaluation. All other key factors, such as material selection, manufacturing, and quality assurance controls, and in-service inspection and maintenance, as noted previously, are also to be accounted for.

(v) The fail-safe design features of the rotor heads and blade retention systems, other critical primary composite structure, and point design features (e.g., bonded metal-to-composite joints) should be assessed and appropriate inspection programs provided to prevent catastrophic failure from flaw/damage propagation.

(vi) The method of generating S-N curves using approved raw data should be demonstrated, evaluated, and approved.

(vii) Any limited life items must be identified and placed in the Airworthiness Limitations section of the maintenance manual in accordance with § 27.571.

(viii) Load spectra, load truncation methods and all other major aspects of the fatigue evaluation are documented in test proposals and approved.

(ix) Flaw growth rates (from initial detectability to the established value for residual strength) must be previously established and closely monitored during substantiation. This data should be used to establish special phased inspections and maintenance intervals for critical structure, as required.

(7) The seventh major area is the dynamic loading and response requirements of § 27.629 for vibration and resonance frequency determination and separation for aeroelastic stability and stability margin determination for flutter critical flight structure. Critical parts, locations, excitation modes, and separations are to be identified and substantiated. This substantiation should consist of analysis supported by tests and tests which account for repeated loading effects and environment exposure effects on critical properties, such as stiffness, mass, and damping. Initial stiffness, residual stiffness, proper critical frequency design, and structural damping are provided as necessary to prevent vibration, resonance, and flutter problems.

(i) All vibration and resonance critical composite structure are identified and properly substantiated.

(ii) All flutter-critical composite structure are identified and properly substantiated. This structure must be shown by analysis to be flutter free to $1.1 V_{NE}$ (or any other critical operating limit, such as V_D , for a VSTOL aircraft) with the extent of damage for which residual strength and stiffness are demonstrated.

(iii) Where appropriate, crash impact dynamics considerations must be taken into account to ensure proper crash resistance and a proper level of occupant safety for an otherwise survivable impact.

(8) The eighth area is the special repair and continued airworthiness requirements of §§ 27.611, 27.1529, and FAR Part 27 Appendix A for composite structures. When repair and continued airworthiness procedures are provided in service documents (including approved sections of the maintenance manual or instructions for continued airworthiness) the resulting repairs and maintenance provisions must be shown to provide structure which continually meets the guidance of paragraphs (1) through (7) of this AC paragraph. All certification based repair and continued airworthiness standards, limits, and inspections must be clearly stated and their provisions and limitations defined and documented to ensure continued airworthiness. In general, no composite repair should be attempted which is out of scope to repairs stated in an approved Structural Repair Manual (SRM) without an engineering design approval by a qualified FAA/AUTHORITY representative (DER or staff engineer). The following minimum criteria should be met in any acceptable composite repair:

(i) The repair should be permanent.

(ii) The repair should restore the structure to the required strength and stiffness.

- (iii) The repair should restore all functional requirements.
- (iv) The repair should have a negligible weight penalty.
- (v) The repair should be aerodynamically compatible.
- (vi) The repair materials should be compatible in all essential aspects with the parent materials.

In summary, primary composite structure is an especially critical structure that requires a clearly defined, phased approval (building block) certification process. This process should involve the entire project certification team from a project's start to its finish so that proper certification is continuously and ultimately achieved. Also, in some special cases, involving new advanced state-of-the-art composite technology, an issue paper may be necessary. However, in the majority of cases (using current composite materials and design philosophy) the applicant's acknowledged use of this advisory material (as recorded in the type board minutes) should eliminate the need for a separate issue paper.

Table A-13. Approved Fasteners for Use in Fiber Reinforced Composite Parts

Near-Side Material	Far-Side Material	Fastener Type	Head Type	Material	Finish	Part Number
Aluminum	Carbon	Blind Bolt	Protruding	Titanium	Aluminum Coating	110-223-()
						CR7771S-()-()
			Flush 100°	Titanium	Aluminum Coating	110-229-()
						CR7770S-()-()EE
			Flush 130°	Titanium	Aluminum Coating	110-225-()
						CR7774S-()-()EE
		Pin Collar	Protruding, Shear	Titanium	Aluminum Coating	100-159-() <u>30-296-()W or 30-298-()</u>
			Flush 100°, Tension	Titanium	Aluminum Coating	100-160-() <u>30-296-()W or 30-297-()W</u>
			Flush 130°, Shear	Titanium	Aluminum Coating	100-158-() <u>30-296-()W or 30-298-()</u>
Carbon	Aluminum	Blind Rivet	Protruding	Monel	IVD	NAS9310M-()
					Aluminum Coating	NAS9307M-()
		Blind Bolt	Protruding	Titanium	Aluminum Coating	110-223-()
			Flush 100°	Titanium	Aluminum Coating	110-229-()
			Flush 130°	Titanium	Aluminum Coating	110-225-() CR7774S-()-()EE
		Pin Collar	Protruding, Shear	Titanium	Aluminum Coating	100-159-() <u>30-295-() or 30-298-()</u>
			Protruding, Tension	Titanium	Aluminum Coating	100-161-() <u>30-296-()W or 30-297-()W</u>
			Flush 100°, Tension	Titanium	Aluminum Coating	100-160-() <u>30-296-()W or 30-297-()W</u>
			Flush 130°, Shear	Titanium	Aluminum Coating	100-158-() <u>30-295-() or 30-298-()</u>
	Steel 1/4 Hard	Blind Rivet	Flush 100°	A286 CRES	DFL	110-151-()
	Carbon	Blind Bolt	Protruding	Titanium	Aluminum Coating	110-223-()
						110-216-()
						CR7771S-()-()
			Flush 130°	Titanium	Aluminum Coating	110-225-()
						110-220-() CR7774S-()-()EE
		Solid Rivet	Flush 100°	Titanium	Phosphate Fluoride	CSR90433-()F
		Pin Collar	Protruding, Shear	Titanium	Aluminum Coating	100-159-() <u>30-296-()W or 30-298-()</u>
			Protruding, Tension	Titanium	Aluminum Coating	100-161-() <u>30-296-()W or 30-297-()W</u>
			Flush 100°, Tension	Titanium	Aluminum Coating	100-160-() <u>30-296-()W or 30-297-()W</u>
			Flush 130°, Shear	Titanium	Aluminum Coating	100-158-() <u>30-296-()W or 30-298-()</u>

Original Config

Export Classification C, ECCN 9E991

BY O. Assim

CHECKED W. Faessler

Bell HelicopterA Textron Company
12,800 RUE DE L'AVENIR, MIRABEL, QUEBEC
REPORT FORM

MODEL 429 PAGE 1.9

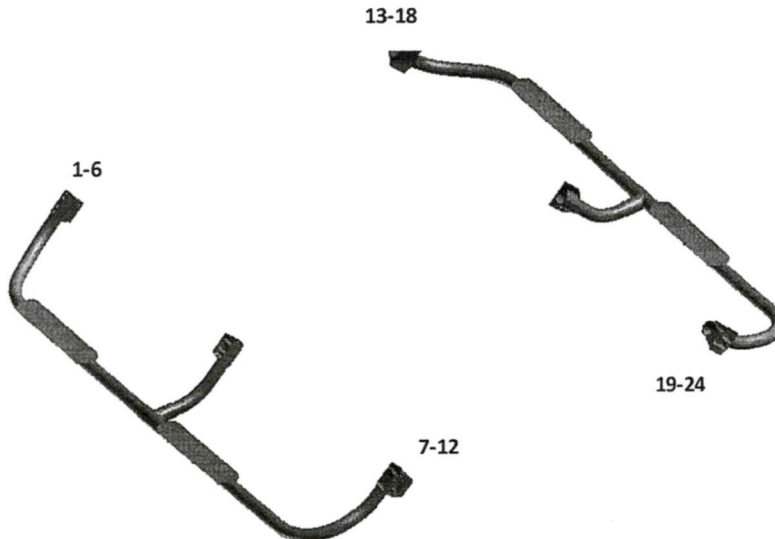
RPT. Cargo Basket

429-030-471-101/102

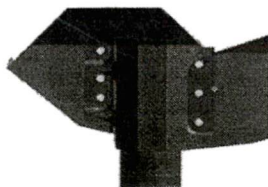
Weight and cost reduction configuration

The PAX step is attached directly to the frames
(at the FW Quarter Frame, the Mid Quarter Frame and Mid Lift Frame) using 6 fasteners

The critical location is the RHS, so the LHS is passed by inspection.



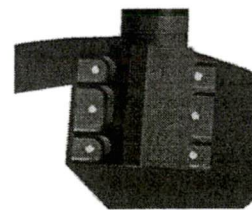
Fastener	x	y	z
1	163.339	-22.8477	9.84343
2	163.228	-23.5396	9.14344
3	163.117	-24.2315	8.44345
4	163.615	-24.6545	11.5856
5	163.504	-25.3464	10.8856
6	163.393	-26.0383	10.1856
7	239.186	-22.46	10.0793
8	239.101	-22.9909	9.54215
9	239.042	-23.3578	9.17099
10	239.425	-24.5814	11.5879
11	239.336	-25.1367	11.0261
12	239.247	-25.692	10.4643
13	163.339	22.8477	9.84343
14	163.228	23.5396	9.14344
15	163.117	24.2315	8.44345
16	163.615	24.6545	11.5856
17	163.504	25.3464	10.8856
18	163.393	26.0383	10.1856
19	239.186	22.46	10.0793
20	239.101	22.9909	9.54215
21	239.042	23.3578	9.17099
22	239.425	24.5814	11.5879
23	239.336	25.1367	11.0261
24	239.247	25.692	10.4643



Mid Lift Frame



MID Quarter Frame



FWD Quarter Frame

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8000.023.00

BY O. Assim

CHECKED W. Faessler



A Textron Company

12,800 RUE DE L'AVENIR, MIRABEL, QUEBEC

REPORT FORM

MODEL 429 PAGE 1.10

RPT. Cargo Basket

429-030-471-101/102

Weight and cost reduction configuration - No drag load

3-D Weighted fastener pattern analysis(Ref. CASA program CV017P)

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Group Properties		Resultant loads about centroid	
X_{xy} : 201.294	b_x : 26.48	F_x : 0.0	
Y_{xy} : 24.240	b_y : 17273.93	F_y : 0.0	
Y_{yz} : 24.240	b_z : 17278.64	F_z : -3001.0	
Z_{yz} : 10.163		M_x : -10684.4	
	b_{xy} : -91.49	M_y : 13081.9	
X_{xz} : 201.294	b_{yz} : 6.10	M_z : 0.0	
Z_{xz} : 10.163	b_{xz} : 69.33		

[illegible]

max	4.9	972.0
min	-5.1	360.4
max	972 lb	

I.I..loA.011.GEN.CargoBasket2.xlsb B.: 1.0.2.0 Prt.: Nov-16-12

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8000.023.00

BY O. Assim

CHECKED W. Faessler



A Textron Company

12,800 RUE DE L'AVENIR, MIRABEL, QUEBEC

REPORT FORM

MODEL 429 PAGE 1.11

RPT. Cargo Basket

429-030-471-101/102

Weight and cost reduction configuration - with drag load

3-D Weighted fastener pattern analysis(Ref. CASA program CV017P)

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Ref. Page

Ref.	Page
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Group Properties		Resultant loads about centroid	
X_{xy} : 201.294	I_x : 26.48	F_x : 817.0	
Y_{xy} : 24.240	I_y : 17273.93	F_y : 0.0	
Y_{yz} : 24.240	I_z : 17278.64	F_z : -3001.0	
Z_{yz} : 10.163		M_x : -10684.4	
	I_{cy} : -91.49	M_y : 12131.6	
X_{xz} : 201.294	I_{yz} : 6.10	M_z : -15531.4	
Z_{xz} : 10.163	I_{xz} : 69.33		

[illegible]

max	73.3	972.1
min	62.9	365.1
max	975 lb	

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8000.023.00

BY O. Assim

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A Textron Company

12,800 RUE DE L'AVENIR, MIRABEL, QUEBEC

REPORT FORM

MODEL 429 PAGE 1.12

RPT. Cargo Basket

429-030-471-101/102

Weight and cost reduction configuration - Empty basket

3-D Weighted fastener pattern analysis(Ref. CASA program CV017P)

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Ref.	Page
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Group Properties		Resultant loads about centroid	
X_{xy} : 201.294	I_x : 26.48	F_x : 817.0	
Y_{xy} : 24.240	I_y : 17273.93	F_y : 0.0	
Y_{yz} : 24.240	I_z : 17278.64	F_z : 0.0	
Z_{yz} : 10.163		M_x : 0.0	
	I_{xy} : -91.49	M_y : -950.3	
X_{xz} : 201.294	I_{yz} : 6.10	M_z : -15531.4	
Z_{xz} : 10.163	I_{xz} : 69.33		

[illegible]

max	69.7	37.5
min	66.5	30.9
max	79 lb	

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WARNING - This document contains technical data whose export is restricted by the Arms Export Control Act (Title 22, U.S.C., Sec 2751, et. Seq.) or the Export Administration Act of 1979, as amended, Title 50, U.S.C., App. 2401 et. Seq. Violations of these export laws are subject to severe criminal penalties. Disseminate in accordance with provisions of DoD Directive 5230.25.

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8000.023.00

BY <u>O. Assim</u>	 A Textron Company 12,800 RUE DE L'AVENIR, MIRABEL, QUEBEC REPORT FORM	MODEL <u>429</u> PAGE <u>1.13</u>
CHECKED <u>W. Faessler</u>		RPT. <u>Cargo Basket</u>

429-030-471-101/102

Comparing Cargo basket loads to Design loads

	Design load	Reference	Cargo Basket load
Max tension	483 lb Ultimate	429-030-400 / 4.26.9 Passenger Step Interface	73.3 lb Max axial load Ultimate
Max Shear	989 lb Ultimate	429-030-400 / 4.26.9 Passenger Step Interface	972 lb Max shear load Ultimate
Max compression	-421 lb Ultimate	429-030-400 / 4.26.9 Passenger Step Interface	73.3 lb Max axial load amplitude Ultimate

Conclusion

Basket loads are less than original 429 step design loads
The critical location is the RHS, so the LHS is passed by inspection.
Therefore basket installation is structurally acceptable for the 429 airframe

WARNING - This document contains technical data whose export is restricted by the Arms Export Control Act (Title 22, U.S.C., Sec 2751, et. Seq.) or the Export Administration Act of 1979, as amended, Title 50, U.S.C., App. 2401 et. Seq. Violations of these export laws are subject to severe criminal penalties. Disseminate in accordance with provisions of DoD Directive 5230.25.

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SERVICE INSTRUCTIONS

SI959.95

BELL 429

QUICK RELEASE CARGO BASKET

CARBON COMPOSITE PANEL LAYUP PROCEDURES

Not used.

Prepared by: Jeff Clarke, CET

Revision 0, 23 April 2014

Aero Design Ltd.



9888A Malaspina Road, Powell River, BC, V8A 0G3

Phone: 604-483-2376

Fax: 604-483-2372

www.aerodesign.ca

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1.0 INTRODUCTION

These instructions are for the production of carbon composite parts used in the Bell 429 (s/n 57081 & subsequent) Cargo Basket Assembly.

2.0 REFERENCE TEXT

Aero Design Drawings:

95965, Revision 0

95966, Revision 0

95967, Revision 0

West System Product Guide 002-950

System 3 SilverTip Product Data Sheet

Endura EX-2C Clear 221 Top Coat Data Sheet

3.0 MATERIALS

PVA (Poly Vinyl Alcohol) mold release agent

Peel-Ply release cloth

Release film

Bleeder cloth

Vacuum Bag Film

Vacuum Bag Sealant Tape

West System 105 Epoxy Resin

West System 205 Hardener (fast)

West System 206 Hardener (slow)

West System 406 Colloidal Silica Adhesive Filler

Style 284 2/2 Twill Carbon Fibre Cloth

Style 120 Plain Weave Kevlar Cloth

Style 7781 Plain Weave S-Glass Fibreglass Cloth

System 3 Silver Tip Epoxy Resin and Hardener

Endura EX-2C Clear 221 Top Coat

Molds:

95965-01-01 – Forward Sheet (Right Hand)

95965-01-02 – Forward Sheet (Left Hand)

Aluminum plate mold (or similar flat smooth surface like glass)

4.0 95965-01-XX FORWARD SHEET

4.1 Procedure – 95965-01-XX Forward Sheet

Mold 95965-01-01 Right hand or 95965-01-02 Left hand.

1. Lay-up is to be done within 60°F – 80°F.
2. Inspect mold to ensure there is no damage and that the surface is clean.
3. Apply PVA mold release agent to surface of mold.
4. Lay up forward sheet with five layers in the following schedule:
 - a. Layer 1 - 0/90 degrees Style 284 2/2 Twill Carbon Fibre
 - b. Layer 2+3 - 45/45 degrees Style 120 Plain Kevlar
 - c. Layer 4+5 - 0/90 degrees Style 284 2/2 Twill Carbon Fibre

Use West System 105 epoxy resin with 206 hardener to wet out cloth, one layer at a time. Mix epoxy resin and hardener in accordance with manufacturer recommendations. Work out all air before applying the next layer.

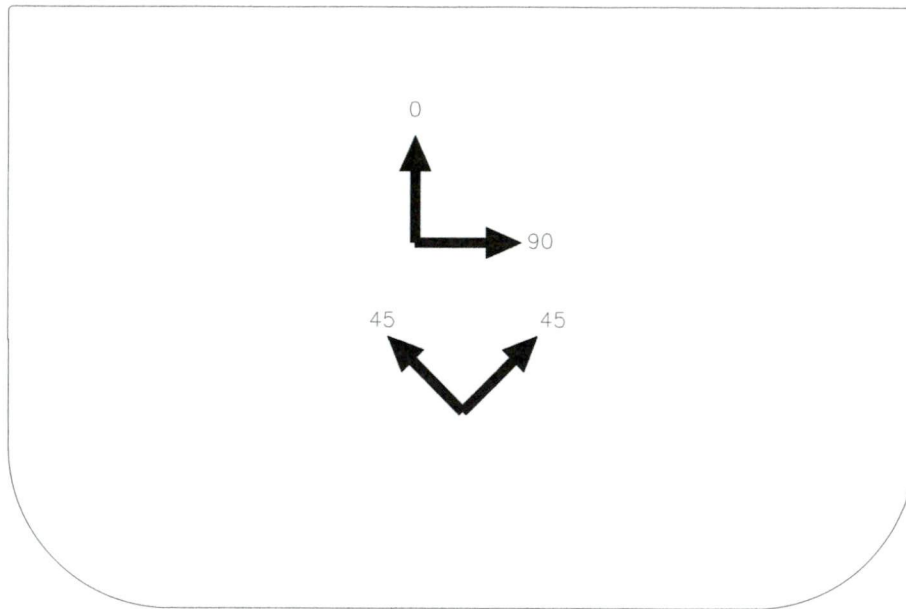


Figure 4.1.1 – Forward Sheet Layup Orientation

5. Apply peel-ply, release film, and bleeder cloth over layup. Vacuum bag around mold.
6. Apply vacuum to 28" Hg, and cure at 40°C for 8 hours.
7. Remove part from mold, taking care not to force the part which may cause the part to fracture.
8. Trim to ¼" larger than finished size shown on drawing 95965, Revision 0. Final trim to be completed on assembly.
9. See section 6.0 for finishing.

4.2 Procedure – 95965-02 Angle

90° Angle mold, 1/16" – 1/8" radius

1. Lay-up is to be done within 60°F – 80°F.
2. Inspect mold to ensure there is no damage and that the surface is clean.
3. Apply PVA mold release agent to surface of mold.
4. Lay up angle with 3 layers in the following schedule:
 - a. Layer 1 - 0/90 degrees Style 284 2/2 Twill Carbon Fibre
 - b. Layer 2 - 45/45 degrees Style 284 2/2 Twill Carbon Fibre
 - c. Layer 3 - 0/90 degrees Style 284 2/2 Twill Carbon Fibre

Use West System 105 epoxy resin with 206 hardener to wet out cloth, one layer at a time. Mix epoxy resin and hardener in accordance with manufacturer recommendations. Work out all air before applying the next layer.

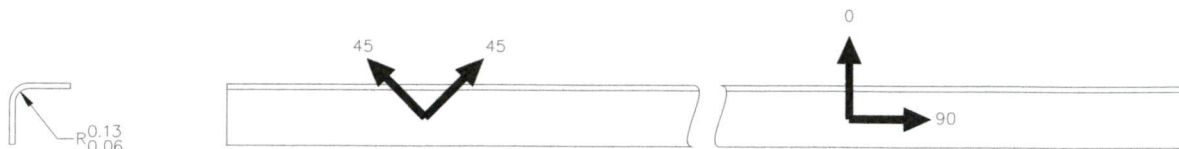


Figure 4.2.1 – Angle Layup Orientation

5. Apply peel-ply, release film, and bleeder cloth over layup. Vacuum bag around mold.
6. Apply vacuum to 28" Hg, and cure at 40°C for 8 hours.
7. Remove part from mold, taking care not to force the part which may cause the part to fracture.
8. Trim to finished size shown on drawing 95965, Revision 0.
9. See section 6.0 for finishing.

4.3 Procedure – 95965-01-XX Forward Sheet Assembly

This procedure is to adhere the angle to the forward sheet on assembly of the basket. Refer to drawing 95950, Revision 0, for basket assembly.

1. Trim 95965-01-XX forward sheet to fit forward hoop of basket.
2. Clamp forward sheet to basket, and locate 95965-02 angle on inside of basket. Trim angle to be flush with inside rim of basket. Mark position of angle on forward sheet, ensure sufficient clearance for tooling to install blind rivets.
3. Mask off area outside of angle location on forward sheet using masking tape. Rough exposed area using 220 grit sandpaper. Rough angle in area to be adhered using 220 grit sandpaper.
4. Adhere angle to forward sheet using West Systems 105 epoxy resin with 205 hardener and 406 colloidal silica adhesive filler. Mix epoxy resin, hardener, and filler in accordance with manufacturer recommendations. Clamp angle to sheet using spring clamps.
5. Cure at room temperature for 24 hours before installation.

5.0 95967-01 LID SHEET / 95966-XX FILLER SHEET

5.1 Procedure - 95967-01 Lid Sheet / 95966-01 Filler sheet

Aluminum plate mold (or similar flat smooth surface like glass)

Parts are made together in one layup and cut apart after curing. Finished size to be at least 29" x 98".

1. Lay-up is to be done within 60°F – 80°F.
2. Inspect mold to ensure there is no damage and that the surface is clean.
3. Apply PVA mold release agent to surface of mold.
4. Lay up sheet with 6 layers in the following schedule:
 - a. Layer 1 + 2 - 0/90 degrees Style 284 2/2 Twill Carbon Fibre
 - b. Layer 3 + 4 - 0/90 degrees Style 7781 Plain Weave S-Glass Fibreglass
 - c. Layer 5 + 6 - 0/90 degrees Style 284 2/2 Twill Carbon Fibre

Use West System 105 epoxy resin with 206 hardener to wet out cloth, one layer at a time. Mix epoxy resin and hardener in accordance with manufacturer recommendations. Work out all air before applying the next layer.

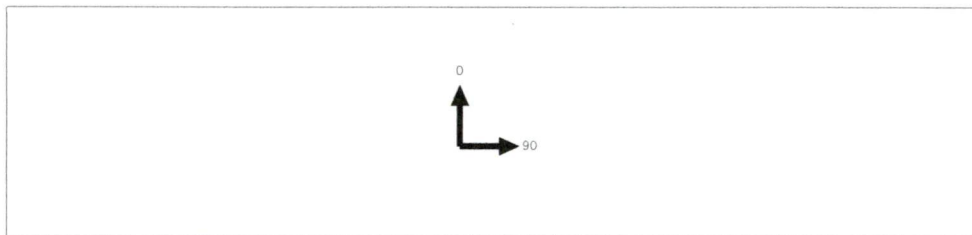


Figure 5.1.1 – Lid Sheet Layup Orientation

5. Apply peel-ply, release film, and bleeder cloth over layup. Vacuum bag around mold.
6. Apply vacuum to 28" Hg, and cure at 40°C for 8 hours.
7. Remove part from mold, taking care not to force the part which may cause the part to fracture.
8. Trim to ¼" larger than finished size shown on drawing 95967, Revision 0 and 95966 Revision 0. Final trim to be completed on assembly.
9. See section 6.0 for finishing.

5.2 Procedure – 95966-02/-03 Filler Sheet

Filler sheets 95966-02 and 95966-03 are used if the filler sheets are made independent of the lid sheet in accordance with section 5.1. The parts are smaller for easier layup and handling. Instructions are the same as section 5.1, with finished size ¼" larger than indicated on drawing 95966, Revision 0.

6.0 FINISHING

The following procedure is used for all of the parts fabricated in accordance with the instructions above.

1. Brush 2 coats of System 3 SilverTip epoxy to coat the part(s). Mix resin and hardener in accordance with manufacturer recommendations.
2. Cure at room temperature for 24 hours.
3. Rough the surface of the part(s) with 320 grit sand paper.
4. Spray Endura EX-2C Clear 221 Top Coat to all surfaces of part(s). Mix components in accordance with manufacturer recommendations. Spraying to be performed at 20°C - 25°C (68°F – 77°F).
5. Cure at room temperature for 24 hours.

Amendment No. 2

**To
Proprietary Rights License and Indemnity Agreement (PRLIA) No. BHTCL0963-00-COM**

This Amendment No. 2 ("Amendment No. 2") to the PRLIA dated as of May 31, 2012, effective June 8, 2012, amended a first time as of June 27, 2012 (collectively the "Agreement"), is made as of this April 18, 2014, by and between **Aero Design Ltd.** (hereinafter "AERO DESIGN"), **Bell Helicopter Textron Canada Limited** (hereinafter "BHTCL"), **Bell Helicopter Textron Inc.** (hereinafter "BHTI") and **Textron Innovations Inc.** (hereinafter "TII"). BHTCL, BHTI, TII, and AERO DESIGN are individually referred to as a "Party" or collectively as the "Parties". BHTCL, BHTI and TII are referred to jointly as "LICENSOR".

WHEREAS, the Parties have entered into the Agreement for the Purpose (as such term is defined in the Agreement);

WHEREAS, considering the progression of the project under the Agreement, the Parties have determined that the Purpose is to be redefined;

WHEREAS, the Parties have determined that data additional to that already provided under the Agreement is to be provided by LICENSOR to AERO DESIGN in support of the Purpose, as it is redefined below;

WHEREAS, as per paragraph 13 of the Agreement, the Agreement is to expire on June 7, 2015 (the "Term");

WHEREAS, the Parties have agreed to extend the Term of the Agreement beyond said date;

NOW THEREFORE, the Parties agree as follows:

1. Paragraph 1 of the Agreement is hereby deleted in its entirety and replaced with the following:

Amendment No. 2 to PRLIA BHTCL0963-00-COM

Initials	AERO DESIGN	BHTCL	BHTI	TII

- “1. The “Purpose” of this Agreement is as follows: to provide to AERO DESIGN certain Data as defined below in support of (i) the development of a cargo basket supplemental type certification (STC) for the Bell 429 helicopter model, and (ii) the revision of the STC (now known as STC #SH12-58) making said STC applicable to serial numbers 57081 and subsequent of the Bell model 429 helicopter.
2. Paragraph 2 of the Agreement is hereby deleted in its entirety and replaced with the following:

“2. LICENSOR agrees to provide AERO DESIGN with the following solely for the Purpose stated above:

- Dwg No. 429-030-080 (Passenger Step Installation);
- Dwg No. 429-030-108 (Fitting Assy);
- Dwg No. 429-030-400 (Cabin Floor Assy);
- Dwg No. 429-030-465 (FWD Quarter Frame Assy);
- Dwg No. 429-030-471 (Mid Lift Frame);
- Dwg No. 429-030-472 (Mid Quarter Frame);
- Dwg No. 429-706-074 (Passenger Step Kit and Provisions);
- Engineering Stress Analysis Report, including airframe loads relevant to basket design and installation; and
- Passenger loads on the cabin step attachments of the aircraft.
- All other data and/or Proprietary Information which the Parties may now or thereafter determine as necessary to AERO DESIGN for the Purpose, the supply of which by LICENSOR hereunder may be subject to the payment of additional fees, including, without limitation, processing fees and/or engineering hours.

hereinafter collectively referred to as the “Data”.”

3. Paragraph 10 of the Agreement is hereby deleted in its entirety and replaced with the following:

“10. The following individuals are designated as the sole point of contact for the respective Parties for the transmittal of Data and Proprietary Information:

AERO DESIGN

Name: Jason Revke
Title: President and General Manager

Amendment No. 2 to PRLIA BHTCL0963-00-COM

Initials	AERO DESIGN	BHTCL	BHTI	TII

Mailing Address: 9888A Malaspina Road
Powell River, British Columbia, Canada V8A 0G3
Telephone no: (604) 483-2376
Facsimile no: (604) 483-2372

BELL HELICOPTER

Name: Arlette Assayag
Title: Contracts Specialist
Mailing Address: 12,800 rue de l'Avenir
Mirabel, Québec, Canada
J7J 1R4
Telephone no: (450) 971-6500 ext. 3499
Facsimile no: (450) 437-2006

TII

Name: James Runstadler
Title: President
Mailing Address: 40 Westminster Street
Providence, RI, USA 02903
Telephone: (401) 457-3577
Fax: (401) 457-3666"

4. The Term of the Agreement (paragraph 13 of the Agreement) is hereby extended to **June 30, 2017** (Term Expiry Date").
5. Capitalized terms not otherwise defined herein shall have the meanings respectively ascribed to them in the Agreement.
6. Except as set forth in this Amendment No. 2, the Agreement shall remain unmodified and in full force and effect.
7. This Amendment No. 2 may be executed in two (2) or more counterparts, each of which shall be deemed an original document, and all of which, together with this writing, shall be deemed one instrument, and signatures transmitted by facsimile or in a PDF file shall be acceptable to bind each Party and shall not affect the validity of this Amendment No. 2 in any way.

Initials	AERO DESIGN	BHTCL	BHTI	TII

The Parties hereto have executed this Amendment No. 2, to be effective as of the date of its signing by the last Party to sign.

Bell Helicopter Textron Canada Limited

SIGNATURE: _____

NAME: Arlette Assayag

TITLE: Contracts Specialist

DATE: _____

Bell Helicopter Textron Inc.

SIGNATURE: _____

NAME: Ignacio Socas

TITLE: Principal Contracts Representative

DATE: _____

Textron Innovations Inc.

SIGNATURE: _____

NAME: James Runstadler

TITLE: President

DATE: _____

Aero Design Ltd.

SIGNATURE: _____

NAME: Jason Revke

TITLE: President and General Manager

DATE: _____



A Textron Company

April 2nd, 2014

Mr. Jeff Clarke
Aero Design Ltd.
9888A Malaspina Road
Powell River, British Columbia, Canada
V8A 0G3

Subject: Fit check of cargo basket fittings P/N 95940-01/-02/-03/-04 on model
429 helicopter post serial number 57081.

Dear Mr. Clarke,

Bell Helicopter has carried out a fit check of the subject fittings on a model 429 helicopter. You will find the results of this fit check in the following pages of this report.

Should you have any questions regarding the results of this fit check, please
Feel free to contact me and I will be happy to help.

Best regards,

SÉBASTIEN ROUSSEAU

Product Support Engineer

Intermediate Group

1-800-463-3036 or (450) 437-2077

pseinter@bh.com

Product Support Engineering

12800 rue de l'Avenir, Mirabel, Quebec J7J 1R4

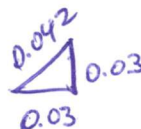
Tel: (450) 437-2077 Fax: (450) 433-0272

Tel : 1-800-463-3036

e-mail : pseinter@bh.com

Measurements:

- Lateral
 - Forward: 52.31" = 26.155
 - Aft: 52.25" / 2 = 26.125
- Longitudinal
 - Left Hand: 74.81"
 - Right Hand: 74.91"
- Perpendicularity

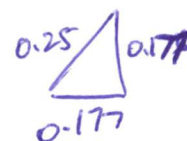


0.04 ~~subtracted~~
added to
aft fitting

1/4" added to
both fittings
to allow seal
on fwd.

Fittings measured for perpendicularity with a digital protractor. The floor of the helicopter was used as a reference point (0.0°).

- Aft Right Hand: 89.9°
- Aft Left Hand: 89.8°
- Fwd Right hand: 88.6°
- Fwd Left hand: 89.8°



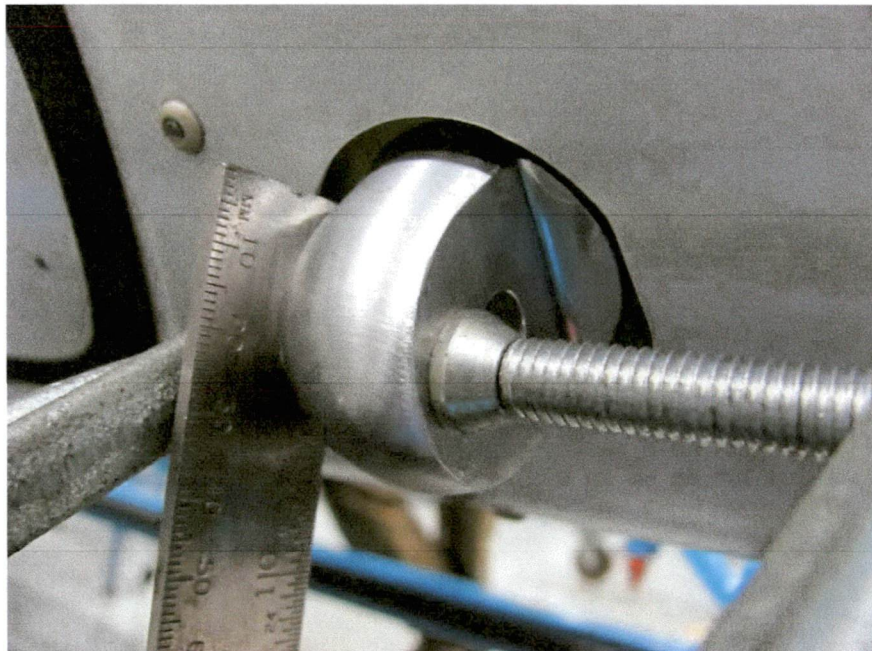
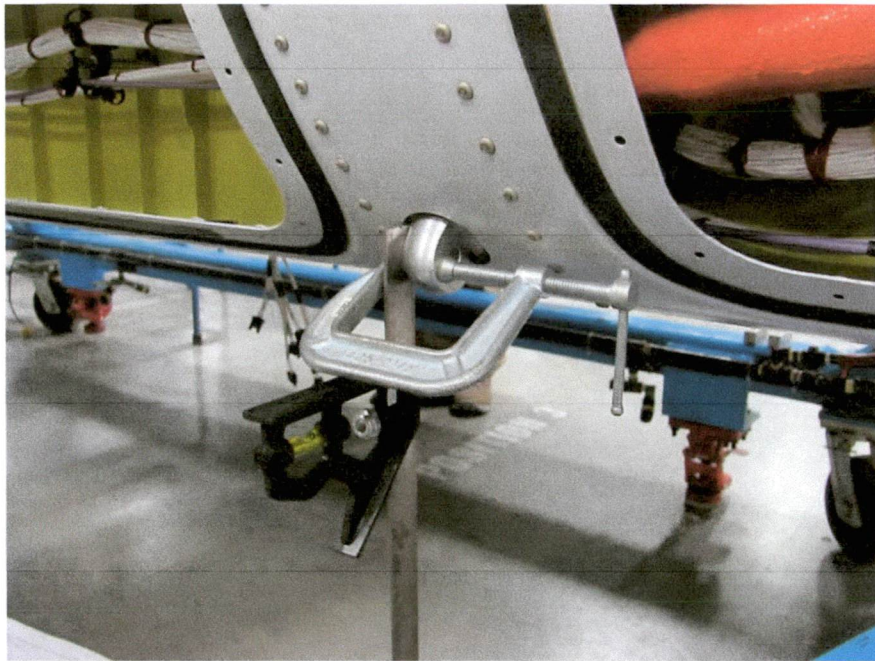
$$26.155 + 0.177 = 26.332$$

Notes:

None of the fittings are flush with the aircraft skin. The forward fittings are over 1/8" deep in relation to the inboard surface of the skin. The aft fittings protrude roughly 1/8" outside of the outboard surface of the skin. See Appendix in the following page for pictures.

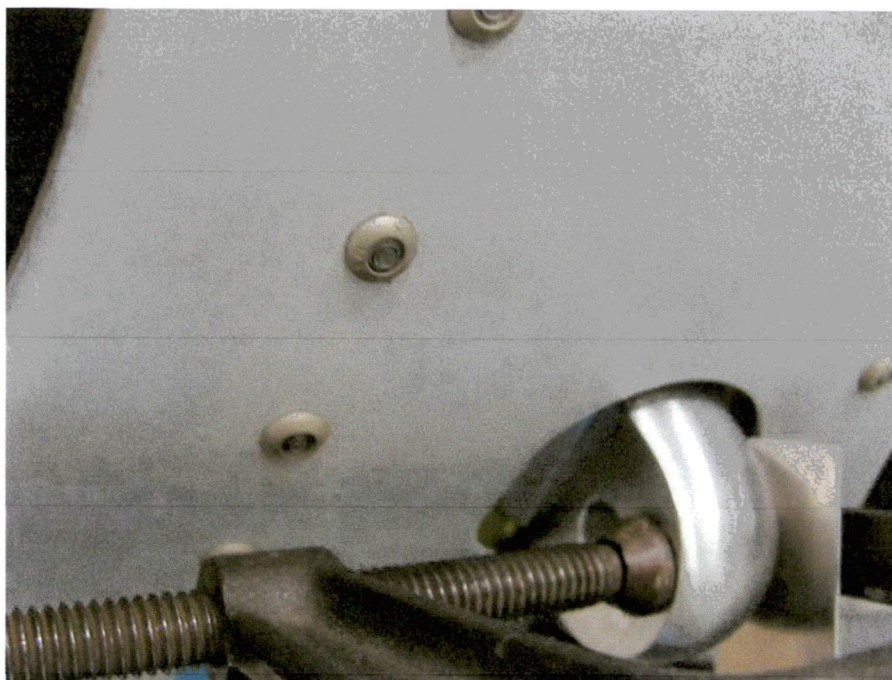
$$52.664$$

Appendix



Forward Right Hand

Product Support Engineering
12800 rue de l'Avenir, Mirabel, Quebec J7J 1R4
Tel: (450) 437-2077 Fax: (450) 433-0272
Tel : 1-800-463-3036
e-mail : pseinter@bh.com



Forward Left Hand



Aft Left hand

Product Support Engineering
12800 rue de l'Avenir, Mirabel, Quebec J7J 1R4
Tel: (450) 437-2077 Fax: (450) 433-0272
Tel : 1-800-463-3036
e-mail : pseinter@bh.com



Aft Right Hand

Product Support Engineering
12800 rue de l'Avenir, Mirabel, Quebec J7J 1R4
Tel: (450) 437-2077 Fax: (450) 433-0272
Tel : 1-800-463-3036
e-mail : pseinter@bh.com

DAR 304's comments wrt ER959.03_0draft1.pdf

Engineering Report, ER959.03
Bell 429, Quick Release Cargo Basket
S/N 67081 & Sub. Configuration
DRAFT
Revision 0, 14 March 2014, 16 Pages
By: Jeff Clark, P.Tech.(Eng.)
Aero Design Ltd

Cover Page
As above.
Okay

ToC Page
Okay

Page 3

1.0 Introduction

Include "delta" type comments wrt the original ER.
i.e.; copy a the important comments from the delta project description.

2.0 Reference Text

Include document rev/date, titles, descriptions and "delta" type notes.
[Don't include Ref Text - These are DAR's ref/check notes]

Engineering Reports;

Should include references to;

TR959.04, 0, 14 Mar 14, Attachment Fitting Load Test

WRT TR959.04 Where is Bell's acceptance that the airframe fittings
can resolve these test loads? *Awaiting Bell*

Are you making the 05/04 type Pins? *Yes*

Installed with tapered pins? *No Bolts*

Instructions wrt installing the tapered pins?

Round all test values to the nearest pound.

TR959.05, 0, 14 Mar 14, Carbon Fibre Panel Load Tests.

[BTW, Does the ICA include any special inspection notes wrt the
Carbon Fibre components?] *Yes - condition + fasteners*

WRT TR959.05 & this report are there any life-time knock-down
factors applicable to carbon fibre parts?

i.e.; analysis and testing to include a 1.X factor? *1.5 factor*

This panel is "more" structural than I originally believed.

i.e.; it seems to be more than the "rain shield" that I
described to TCCA.

Please provide photos drawing of top side of the lid.
i.e.; the panel loads are transferred to the lid's steel tubes.

ER959.01, Rev 0, 6 Sept 12, Quick Release Cargo Basket

Compliance Report, Approved by; DAR 290M

Delta Info; no change to construction or loads?

Ref Text

Reports; ER959.02 - Load Test

Drawings;

95910, 0, Cargo Basket Assy, See item 8, 95916-01, Fwd Sheet

95911, 0, Basket Fabrication, 4130 GTAW

95912, 0, Basket Lid Assy, 4130 GTAW

95920, 0, Fwd Fitting Fab [Billet Machined Part]

95921, 0, Aft Fitting Fab [Billet Machined Part]

95930, 0, Fwd Beam Fab, 304SS GTAW

95931, 0, Aft Beam Fab, 304SS GTAW

ER959.02 Rev 0, 6 Sept 12, Quick Release Cargo Basket

Load Test Report, Approved by; DAR 290M

Ref Text

Reports; ER959.01 - Compliance

Drawings; 95910, 95911, 95912, 95930, 95931

As above.

Installation Drawings;

95905 - Need a copy ✓

95906 - Need a copy ✓

95907 - Need a copy ✓

Fabrication Drawings;

95912 - Need a copy ✓

95932 - Need a copy ✓

95933 - Need a copy ✓

95940 referenced in TR959.04 - Need a copy ✓

95950 - Need a copy ✓

95951 - Need a copy ✓

3.0 BoC

Okay

4.0 Applicability of ADs

Similar note included in the original ER959.01_0 (?)

Okay

→ we normally put
here, not in project descr.

Page 4

5.0 Loads

Okay

Page 5

5.1 Inertia Loads

Okay ✓

5.2 Drag Loads

Most other DARs cannot approve non-published load values.
Include "no change" or "delta" comments.

Page 6

5.2 Drag Loads continued

368 lbf in the aft direction [vs. 1532 lbf up from the lid.]

5.3 Lid Loads [vs. ER959.01_0 5.3 Attachment Fitting Loads]

This is new (Yes for change)

Please up-date;

CP959-1_0 527.301 Loads - Air Drag Loads for FOC by DOT. ✓

How does the CP numbering work? Version - Revision???

Because the last approved CP was CP959 Rev 2 and the current CP is CP959-1
[Rev 0 ???] Didn't continue because changes are not applicable
to original configuration.

Show units in the required equations units. i.e.;

Area $A_{xx} = XX \text{ in}^2 = YY \text{ ft}^2$

Velocity $V_{xx} = XX \text{ knots} = YY \text{ fps}$

etc.

"continuous (non-perforated) sheet" section not "solid"
or a better description and please include the "delta" change info.

is the drag vertical (down wash) or some combination?
✓

5.3.1 Cargo

must support this "distributed" load.

5.3.2 Airflow

Where is the info showing that auto-rotation is higher than the best rate of
climb? wrt weights, performance, angles, combined loading, up/dwn
directions?

There are vert & horz vectors wrt both climb & auto-rotation.

i.e.; qualify this "most conservative" applied vertical load on the lid.

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5.3.2 Airflow continued

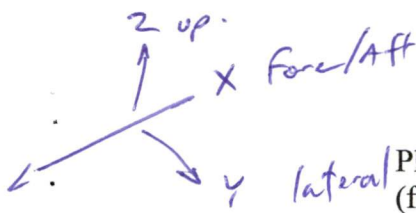
Again show equation type units.

1532 lbf ult up for "auto-rotation" drag vs. 563 lbf ult up for -1.5g ult
inertia???? → same from comment from Jack

5.4 Attachment Fitting Loads

The attachment beam design resolves the Basket Loads into fwd-aft, side & vertical
loads at the basket side fitting and vertical only (?) at the opposite side???

↓
+ fwd-aft
pinned joint, pivots, cannot apply side load



Please show/id as x, y & z vectors per the convention for this aircraft on a 2D - 4 (front views of fwd & aft beams) view free body diagram (FBD) with reference Sta's, BL's & WL's. ✓

Load Location Assumptions
WRT EC959.01_0.pdf;

- a) What happened to the standard width basket option?
- b) What happened to the short basket option? *↑ same*

Page 8

Figure 5.4.1 - Load Locations
[Load and Reaction Locations, BLs only.]

Why does the LHS of the Fwd/Aft Beams extend so far out the opposite side? Step mnts? *Yes*

This is one of the required 4 2D views. ✓

[527.807 Emergency Exits

Noted in CP959-1_0 as "No" Change from CP Rev. 2 and "N/A, Installation does not block doors."

Same note was included in the last CP959_2.pdf, REV. No. 2 22] ✓

Please include door opening info where if the doors can be obstructed by a deformed the Basket and there should be a note about the generous ground clearance.

Do the doors have any emergency exit provisions?

If so please provide copies of the applicable Bell document pages and include some comments in the ER.

[I have noted that a lot of the above info was included in earlier reports and it would to good to note this "per report 959-XX" type references.]

Aft Support Beam Reactions

Vertical Wts $(75 + 300) * 3.5 * 1.5 = 1969 \text{ lbf}$ vs. **Lid @ 1532 lbf**

The FBDs will help show what's happening.

~~Please include shear and moment diagrams for each beam.~~ N/A

~~Where is the combined loading; aft drag plus vertical g load?~~ Combined per Load testing

Page 9

Aft Support Beam Reactions continued

Assumes????

Aren't these exact calculations? *Yes*

[40/60 is a more typical assumption.] - *actual from e/g*

Forward Support Beam Reactions

Where is the combined loading; aft drag plus vertical g load or???

Page 10

Forward Support Beam Reactions continued

Assumes????

Aren't these exact calculations?

Drag Load

Support Beam Reactions

Assuming the basket is rigid how is the loading shared equally?
are there washers or shims for a close fit?
diagram?

the basket does not deform/flex between attachments, beams are not so rigid as to prevent bottoming in horizontal keyway.

2-D FBD's???? ✓

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6.0 Structural Compliance

6.1 Cargo Basket

By test. Refer to ER959.02

Are these aft horz + dwn vert = combined load tests? **YES**

Original tests completed with the lid open!

Lid by test. Refer to TR959.05

dwn vert drag? **YES**

Static load tests pending.

Is the step test a hard requirement via general design??

Better wording??

Brief Review of TR959.05_0draft1.pdf

2.0 Reference Text

Include document rev/date, titles, descriptions and "delta" type notes.

6.2 Mounting Beams

By test. Refer to ER959.02

Are these aft horz + dwn vert = combined load tests? **YES**

Original tests completed with scrap beam sections.

What are the load sharing details???

i.e.; what are the design features???

No? Critical sections key way + stop pin unchanged on test parts to actual parts.

6.3 Attachment Fittings

By test. Refer to TR959.04

Are these aft horz + dwn vert = combined load tests? **YES**

6.4 Helicopter Attachment Points

Data from Bell

Are these aft horz + dwn vert = combined load tests?

Page 12

Blank ✓

Page 13

Appendix A

Title and balance of page Blank? ✓

Page 14

Blank ✓

Page 15

Appendix A

Title and balance of page Blank? ✓

Page 16

Blank ✓

Jeff Clarke

From: Staal, Jack [Jack.Staal@tc.gc.ca]
Sent: March 27, 2014 1:52 PM
To: 'Jeff Clarke'
Subject: RE: Bell 429 Cargo Basket STC Revision

Hi Jeff,

Jim has indicated that he is good to go on tertiary composite structure like this. Cancel my comment below.

Cert Plan/CP accepted.

Sorry for the back and forth. Not that familiar with Jim's system.

Jack

From: Staal, Jack
Sent: Thursday, March 27, 2014 1:32 PM
To: 'Jeff Clarke'
Subject: RE: Bell 429 Cargo Basket STC Revision

Jeff

Jim is not delegated composites. Suggest you get a composites delegate??

Jack

From: Staal, Jack
Sent: Thursday, March 27, 2014 11:21 AM
To: 'Jeff Clarke'
Subject: RE: Bell 429 Cargo Basket STC Revision

Jeff,

Is Jim delegated for composites, this re ..305, 307 and .603, 605, .613. I will check his manual as well. The regulatory requirements specify the need to procure and process materials under approved specifications and processes that control the key material performance parameters, including environmental and variability effects. Will an additional load factor be used to develop the required level of confidence. Is the procedure specified on the drawing already qualified approved ??

Jack

From: Staal, Jack
Sent: Thursday, March 27, 2014 10:29 AM
To: 'Jeff Clarke'
Subject: RE: Bell 429 Cargo Basket STC Revision

Michel OK from a flight test point of view.

27/03/2014

Jack.

From: Jeff Clarke [<mailto:jeff@aerodesign.ca>]
Sent: Wednesday, March 26, 2014 3:06 PM
To: Staal, Jack
Cc: 'Jim Tinson'; Austen, David
Subject: RE: Bell 429 Cargo Basket STC Revision

Hi Jack,

Have you had a chance to review the certification plan I sent on the 13th?

Thank you,
Jeff

From: Jeff Clarke [<mailto:jeff@aerodesign.ca>]
Sent: March 13, 2014 10:08 AM
To: 'Staal, Jack'
Cc: 'Jim Tinson'; 'Austen, David'
Subject: RE: Bell 429 Cargo Basket STC Revision

Hi Jack,

Please see my responses inserted into your emails below. If you have any questions please let me know.

Regards,
Jeff

From: Staal, Jack [<mailto:Jack.Staal@tc.gc.ca>]
Sent: February 20, 2014 2:48 PM
To: Staal, Jack; 'Jeff Clarke'
Cc: 'Jim Tinson'; Austen, David
Subject: RE: Bell 429 Cargo Basket STC Revision

Few more thoughts.

Does the basket body remain in the same position on the helicopter? This re previous flight test validity... performance handling etc?

Basket is shifted forward approx. 1.5 inches, lateral and vertical position not changed. There will be no change to the performance/handling characteristics demonstrated by the original flight test.

Are new attach points evaluated from a stiffness perspective? This related to vibration flight test validity. This question will be posed to Bell. I expect the stiffness to at least be similar as the area of the web of the frames is larger to accommodate the revised step attachment points.

On the flight side co-ordination with Flight Test on these aspects remains open. (Possible flight test). We are open to flight test if necessary, but are hoping to demonstrate equivalent properties to the original installation.

Does crashworthy fuel cell compliance need to be addressed? Basket hangs a bit lower than the step. Fuselage attach at different location.

Attachments are to the same frames as before, and the basket is in the same vertical position, which does not exceed the minimum allowable ground clearance based on the reserve energy drop test for the landing gear.

27/03/2014

Jack

From: Staal, Jack
Sent: Thursday, February 20, 2014 2:17 PM
To: 'Jeff Clarke'
Cc: 'Jim Tinson'; Austen, David; Wong, Henry; Metz, Robert
Subject: RE: Bell 429 Cargo Basket STC Revision

Hi Jeff,

Thanks for the expanded summary.

The original basket attachment points were closely liased with Bell as I recollect.
 Yes it was, and they remain closely involved in this iteration.

How are the helicopter fuselage provisions (not the Aero Design parts) substantiated for the Aero Design Basket loads. Summary didn't really seem to address this aspect. Did Bell provide data for the new design fuselage points.

Bell is providing the attachment load allowables.

It is indicated that due to the compound geometry of a part it is difficult to analyze. A test is proposed to qualify the part, but does not include this complex geometry. An actual conforming part needs to be the test article. The area that is difficult to analyze is the bearing reaction on the socket due to transverse loading, the remainder is straight forward. A conforming article will be used for the test, it simply means the test fixture is rotated 9 degrees from vertical. The test plan will show the details, and acceptance of the test plan and conformity of the test article will be obtained prior to the test.

The Compliance Checklist refers to test per AC43.13-1B. Test is an appropriate means of compliance however the test should be completed in accord with an Aero Design Test Plan. AC43.13 should be removed from the CP. CP updated to remove AC43.13 and reference to Test Reports, attached.

An expanded Certification Plan meeting CAR521 should be included in the submission, the compliance checklist is normally an Appendix to that document.
 Certification Plan CP959.10 is attached.

The composite lid closure would seem be a load carrying element. Inertia up loads from basket contents?? Air Loads, including autorotations?? AC20-107 does mentioned secondary structures and qualification thereof. Inertia and air loads will be analyzed in the engineering report and critical conditions tested as required.

I would have thought the applicant might have been the delegate!

CAR 521.01: "applicant" means an individual or organization responsible for the design of an aeronautical product, or a representative of such an individual or organization, that makes an application for the issuance of or a change to a design approval document in respect of an aeronautical product.

SI 521-005 and AC 521-005, section 5.1: **ANY** (emphasis added) Canadian individual or organization may apply for an STC. Canadian design approval documents are not issued directly to foreign applicants. Refer to Division XI of Subpart 521 of the CARs for more information on foreign applicants.

Why shouldn't the holder of an approval document (Aero Design) be the applicant for revision to said approval?

27/03/2014

Has Jim reviewed the data package???

Jim reviewed the application package before I submitted it, the data package has not been generated but he will be reviewing it as he will be making the findings of compliance.

Is it possible to get a copy of Jim's EPM I am not familiar with it.

Rob/Henry who is Jim's OPI??

I will leave this to Jim / Pacific Region.

Regards,

Jack

From: Jeff Clarke [<mailto:jeff@aerodesign.ca>]

Sent: Thursday, February 20, 2014 9:45 AM

To: Staal, Jack

Cc: 'Jim Tinson'

Subject: Bell 429 Cargo Basket STC Revision

Hi Jack,

Please find attached the application package for revision to our Bell 429 Cargo Basket STC. We are working with Jim Tinson, DAR 304 (cc'd on this email). If you have any questions or need anything further please contact me.

Regards,

Jeff Clarke, P.Tech.(Eng.)

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Phone: 604.483.AERO (2376)

Fax: 604.483.2372

27/03/2014

TEST PLAN AND REPORT

TR959.04

BELL 429

EXTERNAL CARGO BASKET

S/N 57081 & Sub. configuration

Attachment Fitting Load Test

Prepared by: Jeff Clarke, CET

Revision 0, 14 March 2014

Aero Design Ltd.



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1.0 INTRODUCTION

This test plan and report is used to demonstrate compliance with the proof of structure requirements of CAR 527 for the fuselage attachment fittings used with the cargo basket installation on the Bell 429. The helicopter fuselage has sockets used to support the cabin steps on both sides. The cargo basket installation uses the existing sockets with a fitting to attach the mounting beams for the basket. The mounting beams have previously been demonstrated to support the required applied loads and are not demonstrated again.

The sockets are set at a compound angle on the fuselage (45 degrees up and 9 degrees back). The attachment fittings for the cargo basket require vertical attachments to span the width of the helicopter, so the compound angle is built into the lug section of the fitting to provide a vertical attachment point.

The attachment fittings are tested to demonstrate they can support the reaction loads due to the cargo basket installation, and to transfer the loads into the socket fittings.

2.0 REFERENCE TEXT

Aero Design Ltd. Engineering Report ER959.03

Aero Design Ltd. Installation Drawing 95907

Aero Design Ltd. Fabrication Drawing 95940

3.0 LOADS

The loads are determined in Engineering Report ER959.03. The summarized loads on the critical aft fitting are as follows:

$R_{b_rear_lim} = 1170.9 \text{ lbs}$	Limit reaction due to positive maneuvering load
$R_{b_rear_ult} = 1756.4 \text{ lbs}$	Ultimate reaction due to positive maneuvering load
$R_{b_drag_lim} = 166.6 \text{ lbs}$	Limit reaction due to drag load
$R_{b_drag_ult} = 249.9 \text{ lbs}$	Ultimate reaction due to drag load

4.0 TEST SETUP

4.1 Test Article

The test will be performed using 95940-04 Aft Left-hand Lug, fabricated in accordance with drawing 95940, Rev. 0. A completed AN B043 conformity inspection record will be completed by Aero Design Ltd. The part will be available for inspection by Transport Canada prior to testing.

4.2 Fixture

In order to simulate the socket attachment on the helicopter fuselage, and to accommodate pulling the loads in the required directions, a socket is attached to a test fixture consisting of a large I beam with heavy tubing for support legs. The socket is attached such that the vertical

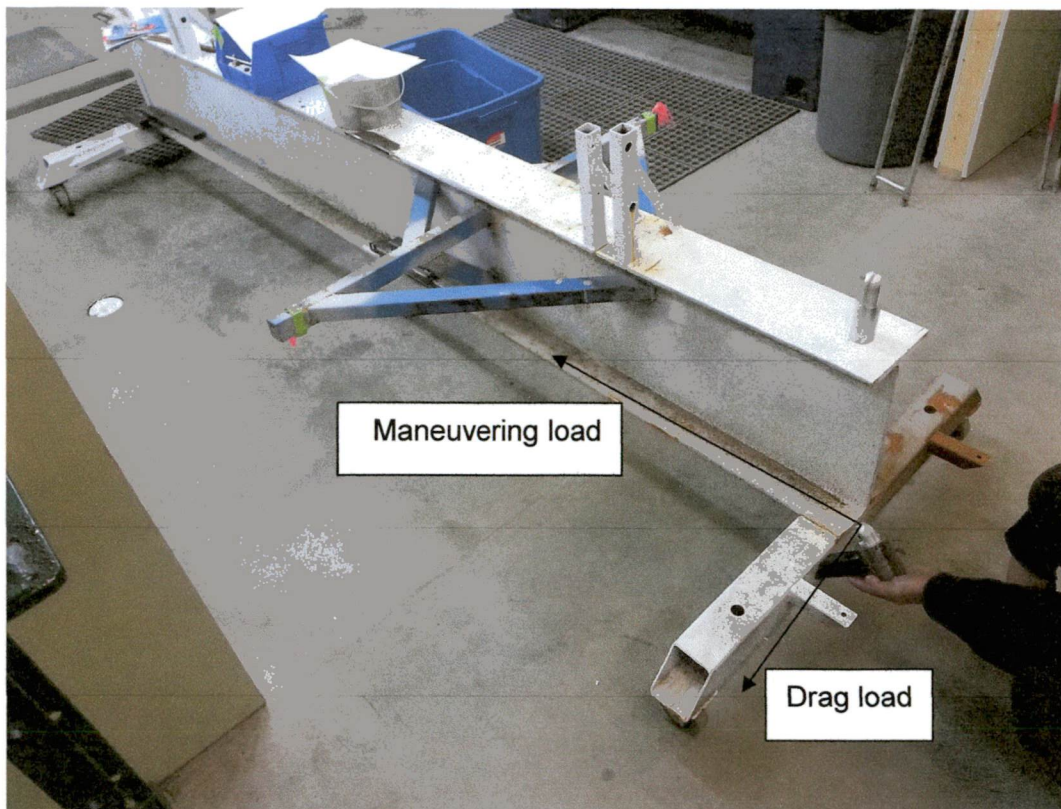


Figure 4.0.2 – Test Setup – Overview



Figure 4.0.3 – Test Setup – End View
(Note socket is rotated 9 degrees from vertical)

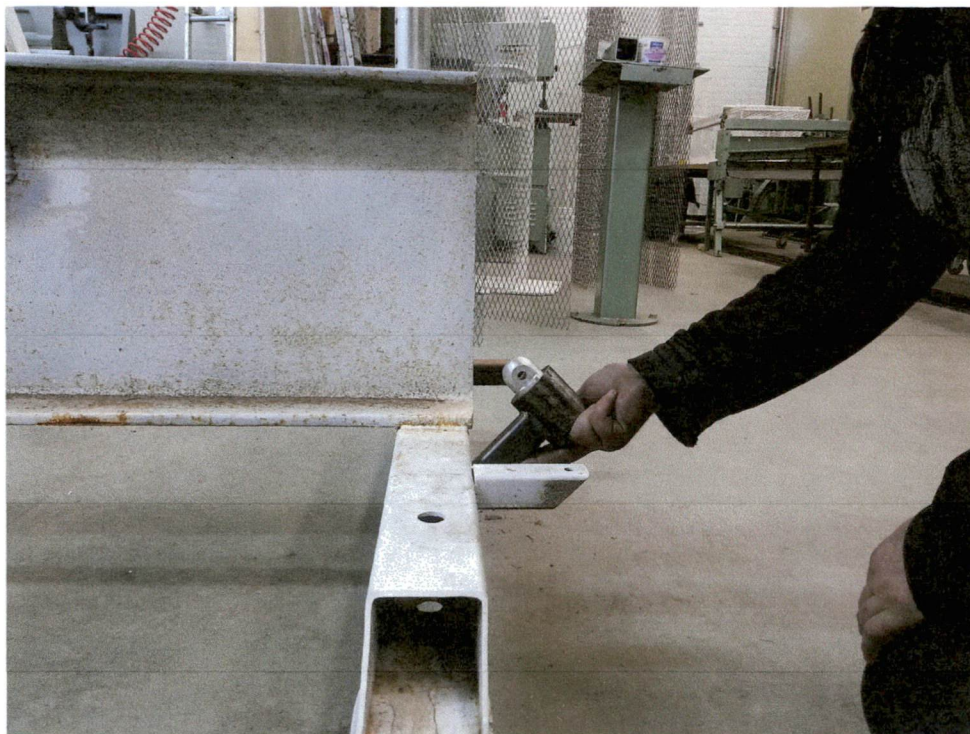


Figure 4.0.4 – Test Setup – Side View
(Note socket is rotated 45 degrees up)

The fitting in the pictures is a forward fitting, the test article will be an aft fitting as the lug sticks out further from the socket. The socket fixture will be welded to the I beam for the test.

4.3 Test Procedure

1. Install the fitting in the socket fixture using commercial Grade 8 5/16" bolts.
2. Pull the maneuvering and drag loads using chain come-alongs attached to load cells in the directions indicated in figure 4.0.2.
3. Apply the limit maneuvering and drag loads simultaneously and hold for at least 3 seconds. Required maneuvering load 1171 lbs, required drag load 167 lbs.
4. Document the test with pictures of the overall test and the load cell readings.
5. Remove the loads, and remove the fitting from the socket.
6. Inspect the fitting visually for signs of permanent deformation.
7. Re-install the fitting in the test fixture.
8. Apply the limit maneuvering and drag loads simultaneously and hold for at least 3 seconds. Required maneuvering load 1756 lbs, required drag load 250 lbs.
9. Document the test with pictures of the overall test and the load cell readings.
10. Remove the loads, and remove the fitting from the socket.
11. Inspect the fitting visually for signs of deformation, failure, cracks, or other damage.
12. Record the results in section 5.0 below.

5.0 TEST RESULTS

5.1 Limit Load

5.2 Ultimate Load

APPENDIX A

TITLE

TEST PLAN AND REPORT

TR959.05

BELL 429

EXTERNAL CARGO BASKET

S/N 57081 & Sub. configuration

Carbon Fibre Panel Load Tests

Prepared by: Jeff Clarke, P.Tech.(Eng.)

Revision 0, 14 March 2014

Aero Design Ltd.



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1.0 INTRODUCTION

This test plan and report is used to demonstrate compliance with the proof of structure requirements of CAR 527 for the carbon fiber lid assembly and front panel used with the cargo basket installation on the Bell 429. Construction of the lid is changed from a sheet of aluminum checker plate riveted to the top side of the lid to a carbon fiber sheet attached with adhesive and rivets to the bottom side of the lid. The forward panel is changed from a flat sheet of aluminum to a carbon fiber panel due to a joggle in the forward end of the basket.

The lid and forward panel are tested to demonstrate that the carbon fiber sheets can support the loads due to restraining cargo and aerodynamic loads in the flight regime.

2.0 REFERENCE TEXT

Aero Design Ltd. Engineering Report ER959.03

Aero Design Ltd. Basket Assembly Drawing 95950

3.0 LOADS

3.1 Air Loads – Lid Panel

The critical aerodynamic loads are determined in Engineering Report ER959.03. The summarized loads on the lid are as follows:

$$P_{\text{drag_lim}} = 1021 \text{ lbs}$$

Limit reaction due to aerodynamic drag load

$$P_{\text{drag_ult}} = 1532 \text{ lbs}$$

Ultimate reaction due to aerodynamic drag load

The drag load is applied vertically to the lid.

3.2 Personnel Loads – Lid Panel

In addition to the critical aerodynamic load required for certification, the lid is checked for a concentrated downward load, in the event that it is stepped on by maintenance personnel or during an emergency exit from the cabin on the basket side. A reinforced walkway section is provided on the lid to protect the carbon fiber panel, but this condition will apply the load directly to the carbon fiber panel.

$$P_{\text{person_lim}} = 200 \text{ lbs} \times 2g = 400 \text{ lbs} \quad \text{Ultimate load due to person stepping on lid}$$

3.3 Air Loads – Front Panel

The critical aerodynamic loads are determined in Engineering Report ER959.03. The summarized loads on the front panel are as follows:

$$P_{\text{drag_lim}} = 246 \text{ lbs}$$

Limit reaction due to aerodynamic drag load

$$P_{\text{drag_ult}} = 368 \text{ lbs}$$

Ultimate reaction due to aerodynamic drag load

4.0 TEST SETUP

4.1 Test Article

The test will be performed using 95950-01-02 Left-hand Cargo Basket Assembly, fabricated in accordance with drawing 95950, Rev. 0 and sub-assembly drawings. A completed AN B043 conformity inspection record will be completed by Aero Design Ltd. The basket is available for inspection by Transport Canada prior to testing.

4.2 Fixture

4.2.1 Air Loads – Lid panel

The mounting beams for the cargo basket are not required for this test as they have been demonstrated previously (see ER959.01 and ER959.02). The drag load to be applied to the lid is an upward load. The cargo basket mounts are simulated by welding a scrap set of mounting beam down tubes to a large I beam, with the mounting beams upside down so the load can be applied downward using bags of lead shot.

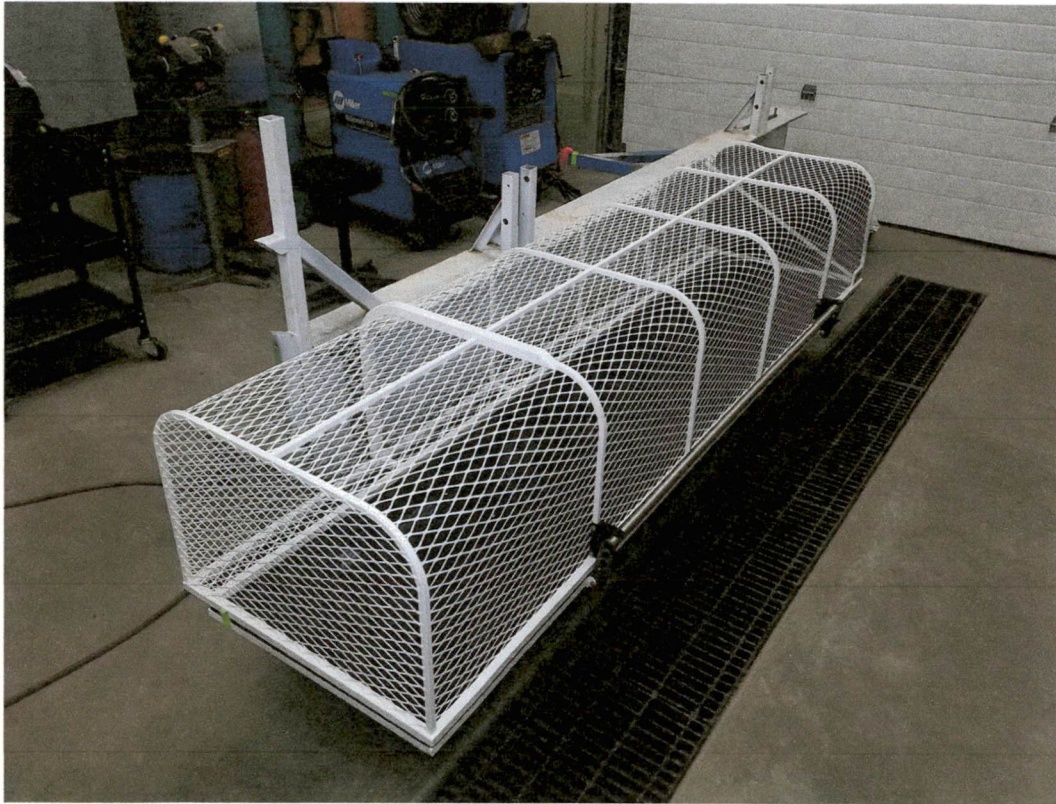


Figure 4.0.1 – Test Setup - Overview
(upside down, load to be stacked on inside of lid)



Figure 4.0.2 – Test Setup – Forward End View



Figure 4.0.3 – Test Setup – Lid Clearance

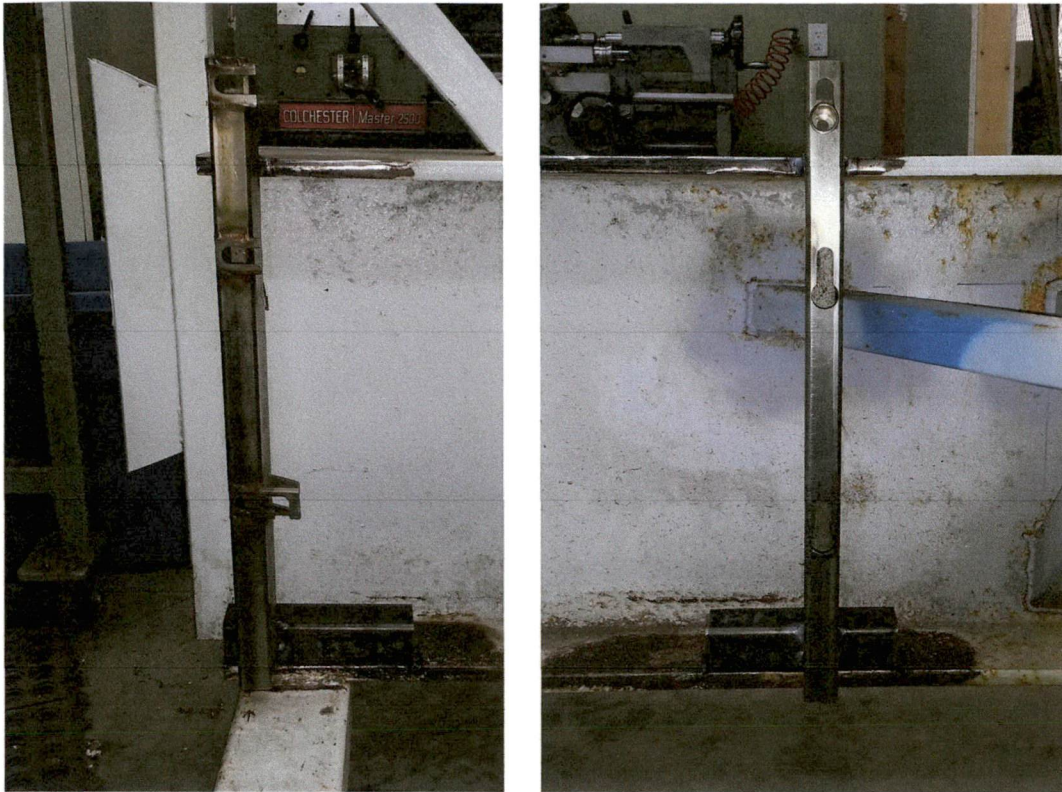


Figure 4.0.4 – Test Setup – Mounting Beams

4.2.2 Personnel Loads

The personnel loads do not need to be applied to the cargo basket mounts as the mounts have been demonstrated to support a much higher load (cargo load at ultimate maneuvering load factor). The load is applied to the basket lid with the basket sitting flat on the floor, no fixture is required.

4.2.3 Air Loads – Front panel

The mounting beams and cargo basket are not required for this test as they have been demonstrated previously (see ER959.01 and ER959.02) to support the required load. The drag load to be applied to the front panel is an aft load. The load is applied to the front end of the cargo basket with the basket standing upright on the floor.

4.3 Test Procedure

4.3.1 Air Loads – Lid Panel

1. Set the basket assembly upside down on a pallet jack, suitably padded to protect and support the basket. Open the basket to allow loading the inside surface of the lid.
2. Apply the limit load downward using bags of lead shot, 25 lbs each, evenly distributed over the surface of the lid. 41 bags are required (1025 lbs).

3. Close the basket and latch the handle. Install the basket on the mounting beams. The retaining pin in the forward beam must be extended to retain the basket in the beam. Slowly lower the pallet jack to clear the basket.
4. The load must be applied for at least 3 seconds.
5. Document the test with pictures of the bags of lead shot stacked on the lid and of the overall test once the basket is attached to the mounting beams and the pallet jack is lowered.
6. Raise the pallet jack to support the basket. Remove the basket from the mounting beams. Remove the load from the basket lid.
7. Visually inspect the lid, hinge, handle and brackets for signs of permanent deformation. Ensure correct functioning of handle latching.
8. Apply the ultimate load downward using bags of lead shot, 25 lbs each, evenly distributed over the surface of the lid. 62 bags are required (1550 lbs).
9. Close the basket and latch the handle. Install the basket on the mounting beams. The retaining pin in the forward beam must be extended to retain the basket in the beam. Slowly lower the pallet jack to clear the basket.
10. The load must be applied for at least 3 seconds.
11. Document the test with pictures of the bags of lead shot stacked on the lid and of the overall test once the basket is attached to the mounting beams and the pallet jack is lowered.
12. Raise the pallet jack to support the basket. Remove the basket from the mounting beams. Remove the load from the basket lid.
13. Visually inspect the lid, hinge, handle and brackets for signs of permanent deformation. Ensure correct functioning of handle latching.
14. Record the results in section 5.0 below.

4.3.2 Personnel Loads

1. Set the basket assembly on the floor with suitable padding to protect the basket.
2. Use a piece of 2x6, approximately 12" long to simulate stepping on the lid panel between the rim and walkway section. Apply the limit load downward using bags of lead shot, 25 lbs each. 16 bags are required (400 lbs). Do not allow the bags to rest on the rim or walkway section. Use a piece of plywood on top of the 2x6 if required.
3. The load must be applied for at least 3 seconds.
4. Document the test with pictures of the bags of lead shot stacked on the lid.
5. Remove the load removed from the lid.
6. Inspect the lid panel visually for signs of permanent deformation, cracks or other damage.
7. Record the results in section 5.0 below.

4.3.3 Air Loads – Forward Panel

1. Set the basket assembly standing up, suitably padded to protect and support the basket.

2. Apply the limit load to the forward panel downward using bags of lead shot, 25 lbs each, evenly distributed over the surface of the front panel. 10 bags (250 lbs) is required.
3. The limit load must be applied for at least 3 seconds.
4. Document the test with pictures of the bags of lead shot stacked on the front panel and of the overall test.
5. Remove the load.
6. Inspect the front panel visually for signs of permanent deformation, cracking, or other damage.
7. Apply the ultimate load downward using bags of lead shot, 25 lbs each, evenly distributed over the surface of the front panel. 15 bags (375 lbs) is required.
8. The ultimate load must be applied for at least 3 seconds.
9. Document the test with pictures of the bags of lead shot stacked on the front panel and of the overall test.
10. Remove the load.
11. Inspect the front panel visually for signs of failure, deformation, cracking, or other damage.
12. Record the results in section 5.0 below.

5.0 TEST RESULTS

5.1 Air Loads - Lid Panel

5.1.1 Limit Load

5.1.2 Ultimate Load

5.2 Personnel Loads - Lid Panel

5.2.1 Ultimate Load

5.3 Air Loads - Forward Panel

5.3.1 Limit Load

5.3.2 Ultimate Load

APPENDIX A

TITLE



A Textron Company

Mirabel, February 7, 2014

VIA EMAIL

Mr. Jeff Clarke, Vice President
Aero Design Ltd.
9888A Malaspina Road
Powell River (British Columbia)
V8A 0G3

Subject: Data in Support of revising STC #SH12-58 (cargo basket) for the Bell 429

Reference: 1) CACDR Service Order 8000267910

Dear Mr. Clarke:

Further to your request at Reference 1) above, Bell Helicopter Textron Canada Limited ("BHTCL") is pleased to provide the present proposal to Aero Design Ltd. (herein referred to as "AERO DESIGN") for the furnishing of certain Loads Data (as defined below) in support of the revision of AERO DESIGN's supplemental type certificate number SH12-58 (the "STC") pertaining to the following type design change, namely the installation of a cargo basket to the Bell 429 helicopter model.

Indeed, as you know, a Proprietary Rights License and Indemnity Agreement (PRLIA) was first signed by and between BHTCL, Bell Helicopter Textron Inc. ("BHTI"), Textron Innovations Inc. ("TII") (BHTCL, BHTI and TII collectively "LICENSOR") and AERO DESIGN for the development phase of the STC, effective June 8, 2012. This PRLIA was amended a first time as of June 27, 2012, in order to broaden the data to be provided thereunder by LICENSOR to AERO DESIGN.

Bell Helicopters

It is understood that AERO DESIGN now wishes to revise the STC in order to make it applicable to serial numbers 57081 and subsequent of the Bell model 429 helicopter, which endeavor requires Bell Engineering assistance, namely to provide passenger loads data on the cabin step attachments of the Bell model 429 helicopter (the "Loads Data").

BHTCL therefore proposes to amend the PRLIA a second time to broaden its Purpose (as defined therein) in order to include LICENSOR's assistance to AERO DESIGN in the latter's efforts to revise its STC, the whole in order for LICENSOR to be able to provide AERO DESIGN with the Loads Data under the terms and conditions of the PRLIA.

Bell Helicopter Textron Canada Limited
12 800, rue de l'Avenir, Mirabel, Quebec J7J 1R4, CANADA
(450) 971-6500
www.bellhelicopter.com

Initials	AERO DESIGN



A Textron Company

Based on experience, an estimated forty (40) Engineering man-hours will be necessary in order to generate the Loads Data. At an hourly rate of \$227.00 USD, the estimated cost for generating the Loads Data is of the order of **\$9,080.00 USD** plus all applicable taxes.

Furthermore, the estimated cost for the preparation and processing of the Loads Data is of the order of \$800.00 USD, plus all applicable taxes.

The following terms and conditions are applicable:

- AERO DESIGN shall not disclose any information in connection with the present proposal to any third parties;
- LICENSOR's obligations hereunder are limited to preparing and providing AERO DESIGN with the Loads Data;
- BHTCL shall not be responsible for obtaining any necessary approvals and/or certifications;
- Any additional man-hour beyond said aforementioned estimated forty (40) Engineering man-hours required to accomplish the Purpose will be charged at an hourly rate of \$227.00 USD, plus all applicable taxes;
- BHTCL will invoice AERO DESIGN for the total costs hereunder upon providing AERO DESIGN with the Loads Data;
- Terms of payment are net 30 days from submission of invoice;
- The present is subject to the availability of the appropriate BHTCL resources, and all permits and/or licenses and/or other authorizations, which will or may be required either by virtue of the U.S International Traffic in Arms Regulations (ITAR)/Canadian Export and Import Permits Act (EIPA) or other reasons;
- The present proposal is valid for 30 days.

Should this proposal be acceptable to AERO DESIGN, the execution of a second amendment ("Amendment No. 02") to the PRLIA mentioned above between LICENSOR and AERO DESIGN will be required prior to providing the Loads Data.

This proposal and LICENSOR's ability to enter into and comply with a contract resulting from this proposal are subject to applicable Canadian and/or U.S. Government Export and Import laws and regulations. The Loads Data referenced in this proposal should not be furnished to other parties, including Canadian and/or U.S. Government sanctioned countries and denied parties, or re-exported without the required Canadian and/or U.S. Government licenses. It is understood that the following clause included in the executed PRLIA shall remain effective for its Amendment No. 02 and applicable to the transfer of all Data (which is to include the Loads Data):

Bell Helicopter Textron Canada Limited
12 800, rue de l'Avenir, Mirabel, Quebec J7J 1R4, CANADA
(450) 971-6500
www.bellhelicopter.com

Initials	AERO DESIGN



A Textron Company

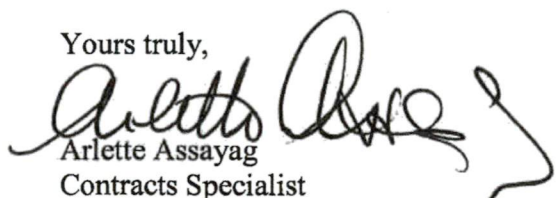
"EXPORT/IMPORT REGULATIONS: The Parties acknowledge and agree that LICENSOR's obligation to provide the Data and/or Proprietary Information under this Agreement is expressly subject to U.S. and/or Canadian export/import laws, rules and regulations as well as any other similar export/import controls requirements of any other jurisdiction ("Export/Import Laws"). If required, AERO DESIGN agrees to cooperate fully with LICENSOR to obtain such a license.

AERO DESIGN will not use, distribute, transfer or transmit the Data and/or Proprietary Information provided under this Agreement except in compliance with the applicable Export/Import Laws, specifically including, but not limited to, U.S. and Canadian laws and regulations prohibiting re-export of such Data and/or Proprietary Information to certain prohibited jurisdictions and restricted parties. In no event shall LICENSOR be obligated under this Agreement to provide access to or furnish the Data and/or Proprietary Information to any person except in compliance with applicable Export/Import Laws, policies and license conditions. In the event that LICENSOR is unable to secure such authorization or has determined in its sole discretion that the U.S. and/or Canadian Government will not issue such authorization, LICENSOR shall be entitled to terminate this Agreement. In the event of such termination, LICENSOR shall be excused from the obligation to deliver the Data and/or Proprietary Information and shall not be liable to AERO DESIGN for any loss, cost or expense arising from such non-delivery or termination (including any actual, consequential or other damages of any kind whatsoever). The sole liability of LICENSOR shall be to return any payments made by AERO DESIGN for such Data and/or Proprietary Information not delivered. The obligations stated above in this clause will survive the expiration, cancellation or termination of this Agreement or any other related agreement."

We trust this proposal will satisfy your request and meet with your approval.

We remain available to discuss with you in further details this proposal should you deem it necessary. Do not hesitate to contact us at your convenience.

Yours truly,



Arlette Assayag
Contracts Specialist
Bell Helicopter Textron Canada Limited
Tel.: (450) 971-6500 ext. 3499
Facsimile: (450) 437-2006

Cc. Michael Vautour

Bell Helicopter Textron Canada Limited
12 800, rue de l'Avenir, Mirabel, Quebec J7J 1R4, CANADA
(450) 971-6500
www.bellhelicopter.com

Initials	AERO
	DESIGN



A Textron Company

We hereby confirm that we accept this proposal and agree to be bound by the terms and conditions contained herein.

Aero Design Ltd.

Signature:

Name(Print):

Title:

Date:

Bell Helicopter Textron Canada Limited
12 800, rue de l'Avenir, Mirabel, Quebec J7J 1R4, CANADA
(450) 971-6500
www.bellhelicopter.com



A Textron Company

PROPRIETARY RIGHTS LICENSE AND INDEMNITY AGREEMENT

BETWEEN

BELL HELICOPTER TEXTRON CANADA LIMITED

AND

BELL HELICOPTER TEXTRON INC.

AND

TEXTRON INNOVATIONS INC.

AND


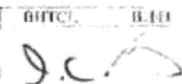


AERO DESIGN LTD.

Contract# BHITCL0963-00-COM

THIS PROPRIETARY RIGHTS LICENSE AND INDEMNITY AGREEMENT (hereinafter "Agreement") is made as of this 31st day of May, 2012, by and between Aero Design Ltd. (hereinafter "AERO DESIGN"), Bell Helicopter Textron Canada Limited, a Canadian corporation, (hereinafter referred to as "BHITCL"), Bell Helicopter Textron Inc. (hereinafter referred to as "BHITI") and Textron Innovations Inc., a Delaware corporation (hereinafter referred to as "TI"). BHITCL, BHITI, TI, and AERO DESIGN are individually referred to as a "Party" or collectively as "Parties". BHITCL, BHITI and TI are referred to jointly as "LICENSOR".

WHEREAS, LICENSOR and AERO DESIGN have entered into this Agreement for the Purpose as defined below; and

WHEREAS, LICENSOR has agreed, subject to the terms of this Agreement, and those of the BHITCL proposal dated May 15, 2012, duly accepted by AERO DESIGN as of May 30, 2012 (the "Proposal"), to provide AERO DESIGN certain Data as defined below in support of the Purpose; and

Indicates:  BHITCL:  BHTI:  TI: 

WHEREAS, LICENSOR is not willing to incur the liability risks resulting from its assistance except on terms and conditions contained herein;

NOW THEREFORE, in consideration of LICENSOR assisting AERO DESIGN as described herein, the Parties hereby agree as follows:

1. The "Purpose" of this Agreement is as follows: to provide to AERO DESIGN certain Data as defined below in support of developing a cargo basket supplemental type certification for the Bell 429 helicopter model.
2. LICENSOR agrees to provide AERO DESIGN with the following solely for the Purpose stated above:
 - ✓ • Dwg No. 429-030-080 (Passenger Step Installation);
 - ✓ • Dwg No. 429-030-108 (Fitting Assy);
 - ✓ • Dwg No. 429-030-400 (Cabin Floor Assy);
 - ✓ • Dwg No. 429-030-465 (FWD Quarter Frame Assy);
 - ✓ • Dwg No. 429-030-471 (Mid Lift Frame);
 - ✓ • Dwg No. 429-030-472 (Mid Quarter Frame);
 - ✓ • Dwg No. 429-706-074 (Passenger Step Kit and Provisions); and
 - ✓ • Engineering Stress Analysis Report, including airframe loads relevant to basket design and installation;

hereinafter collectively referred to as the "Data".

3. In consideration of the data rights licensed herein, AERO DESIGN shall pay a one-time fixed fee of One Thousand US Dollars (\$1,000.00 USD) to TH, the payment of which will be due upon execution of this Agreement by all Parties, and made by bank transfer in US Dollars to:

Account Name:	Textron Innovations Inc.
Account Number:	323269214
Bank Name:	JPMorgan Chase Bank
Bank Address:	1 Chase Manhattan Plaza, New York, NY 10006
ABA/Rtg:	021000021
SWIFT:	CHASUS33Bank:

AERO DESIGN	TH	TH	TH

4. AERO DESIGN is solely responsible for the resulting project using the Data or Proprietary Information (as hereinafter defined) supplied by LICENSOR.
5. AERO DESIGN shall not disclose any information in connection with the Purpose of this Agreement to any third parties. Such information may only be disclosed between the Parties to this Agreement.
6. AERO DESIGN agrees to indemnify and hold harmless LICENSOR, its directors, officers, employees, agents and successors from and against absolutely every liability, loss, damage, expense and cost, including without limitation costs of defence and attorneys' fees which may arise by reason of:
 - a. Mental anguish and bodily injury, including disease or death resulting therefrom, sustained by any person or persons, including without limitation directors, officers, employees and agents of AERO DESIGN, or
 - b. Damage to property, including any property owned by AERO DESIGN or any other party's property without limitation consequential damages and loss of use thereof, and
 - c. All direct, incidental and consequential damages resulting therefrom, to the extent caused (a) by AERO DESIGN use of the Data or Proprietary Information provided for hereunder, (b) by employment of the project in any way, and (c) by the use of the Data or Proprietary Information regardless whether any claim as aforesaid is alleged to have arisen in whole or in part out of the acts or omissions of LICENSOR, its directors, officers, employees or agents, or any of them, and regardless of whether such claims or suits are based upon the theories of breach of contract, negligence, strict liability in tort, or otherwise.
7. AERO DESIGN agrees, at its own expense, to defend LICENSOR, its directors, officers, employees, agents and successors against any and all actions, suits or other legal proceedings that may be brought or instituted upon any claim or demand alleging any claim covered by the indemnity agreement in Paragraph 6 above, and to keep LICENSOR informed at reasonable intervals of significant developments in such actions.

Initials	AERO DESIGN	LICENSOR	BHT	TH
	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>

8. LICENSOR agrees to give AERO DESIGN prompt notice of any such claim or legal action after receipt or notification thereof; to tender to AERO DESIGN the defence and handling of any such claim and legal action, including the right at AERO DESIGN sole discretion to settle or compromise such claim or action at AERO DESIGN sole expense; and to cooperate with AERO DESIGN in the defence of every such claim or legal action at the sole expense of AERO DESIGN.

9.

In the event that AERO DESIGN is not the operator of the Bell helicopter(s) identified herein or is not performing itself the Project hereunder, and in the event any portion of the Project is being performed on behalf of AERO DESIGN by any third party (hereinafter referred to as "Third Party"), then AERO DESIGN agrees that it shall flow down in an agreement with such Third Party the exact same terms and conditions as contained herein. Furthermore, said Third Party shall concur with and be bound by said flow down terms and conditions, including any and all obligations, responsibilities and liabilities of AERO DESIGN hereunder, in the same manner as if they were party to this agreement. It is expressly understood that no other party shall perform the work hereunder unless it has received prior written authorization by LICENSOR.

10. The following individuals are designated as the sole point of contact for the respective Parties for the transmittal of Data and Proprietary Information:

AERO DESIGN

Name: Edward (Ted) Burgoin
Title: President
Mailing Address: 2013, 39th Ave. NE
Calgary, Alberta, Canada
T2E 6R7
Telephone no: (403) 250-8027
Facsimile no: (403) 250-8333

Prepared by: [Signature] Date: [Signature]
Reviewed by: [Signature] Date: [Signature]
Approved by: [Signature] Date: [Signature]

BELL HELICOPTER

Name: Arlette Assayag
Title: Contracts Administrator
Mailing Address: 12,800 rue de l'Avenir
Mirabel, Québec, Canada
J7J 1R4
Telephone no: (450) 971-6500 ext 3499
Facsimile no: (450) 971-6039

TII

Name: James Runstadler
Title: Vice President - Licensing
Mailing Address: 40 Westminster Street
Providence, RI, USA
02903
Telephone: (401) 457-3577
Fax: (401) 457-3666

11. AERO DESIGN agrees to use the Data and/or Proprietary Information solely for the Purpose as described herein and agrees as follows:

a. In addition to the information described above, for the purposes of this Agreement, "Proprietary Information" shall also mean information or material proprietary to LICENSOR or designated as Proprietary Information by LICENSOR, and information that AERO DESIGN develops from Data and/or LICENSOR Proprietary Information, which AERO DESIGN may obtain knowledge or access through or as a result of AERO DESIGN's relationship with LICENSOR, (including information conceived, originated, discovered or developed in whole or in part by AERO DESIGN). The Proprietary Information includes, but is not limited to, the following types of information and other information of a similar nature (whether or not reduced to writing): discoveries, ideas, concepts, software in various stages of development, designs, drawings, specifications, techniques, models, data, source code, object code,

Initials	AERO DESIGN	BELL	BELL	TII
	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>

documentation, diagrams, flow charts, research, development, processes, procedures, "know-how", marketing techniques and materials, marketing and development plans, customer names and other information related to customers, price lists, pricing policies and financial information. Proprietary Information also includes any information described above which LICENSOR obtains from another party and which LICENSOR treats as proprietary or designates as Proprietary Information, whether or not owned or developed by LICENSOR. The recipient of Proprietary Information shall be under no obligation with respect to any information: (a) which is, at the time of disclosure, available to the general public; or (b) which becomes at a later date available to the general public through no fault of the recipient and then only after said later date; or (c) which recipient can demonstrate was in its rightful possession prior to the date of this Agreement; or (d) which is disclosed to recipient without restriction on disclosure by a third party who has the lawful right to disclose such information. The recipient should notify the other Party if Proprietary Information covered by this Agreement is thought to have passed into the public domain.

b. That proprietary information developed exclusively by AERO DESIGN in the production or use of articles developed exclusively by AERO DESIGN without using in part or in whole LICENSOR Proprietary Information in the course of work performed within the scope of this Agreement belongs to AERO DESIGN. LICENSOR supplied Data and/or Proprietary Information shall belong exclusively to LICENSOR. AERO DESIGN agrees to promptly return all copies of Data and Proprietary Information in AERO DESIGN possession upon request or upon termination or expiration of this Agreement, whichever occurs first.

c. AERO DESIGN agrees during the term of this Agreement and thereafter to hold in confidence and not to directly or indirectly reveal, report, publish, disclose or transfer any of the Data or Proprietary Information to any person or entity, or utilize any of the Data or Proprietary Information for any purpose, except in the course of work within the Purpose of this Agreement.

d. Because of the unique nature of the Data and Proprietary Information, AERO DESIGN understands and agrees that LICENSOR will, in addition to any other remedies available to it at law or in equity, be entitled to injunctive relief to enforce the terms of this Agreement.

Indust	AERO DESIGN	DATE	DATE	GO
	P.B.	D.C.		

c. AERO DESIGN agrees that it shall neither refer to LICENSOR nor advertise that the resulting product of this Agreement has been approved or certified by LICENSOR.

f. LICENSOR MAKES NO WARRANTY TO AERO DESIGN EXPRESS OR IMPLIED WITH RESPECT TO THE DATA OR PROPRIETARY INFORMATION DELIVERED HEREUNDER INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR FREEDOM FROM PATENT INFRINGEMENT WHETHER ARISING BY LAW, CUSTOM OR CONDUCT.

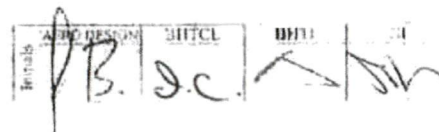
12. Neither this Agreement nor any rights or obligations of AERO DESIGN under the Agreement shall be assigned or transferred without the prior written consent of LICENSOR.
13. The term of this Agreement shall commence on the date of its signing by the last Party to sign (Effective Date) and shall terminate in three (3) years thereafter unless extended or terminated earlier by either Party. Any provisions of this Agreement which by their nature extend beyond its termination, such as the provisions in Paragraph 11 prohibiting the disclosure of Proprietary Information to third parties, will remain in effect beyond such termination and will apply to either Party's successors and assigns indefinitely.
14. This Agreement shall be governed by the laws of the Province of Ontario, Canada. This Agreement contains the full and complete understanding of the Parties with respect to the subject matter hereof and supersedes all prior representations and understanding, whether oral or written. In the event of any dispute or claim arising out of this Agreement, the Parties hereby agree that any lawsuit or other legal action shall be filled in the courts of general jurisdiction in the City of Ottawa, Province of Ontario.
15. This Agreement has priority over any conflicting agreement between the Parties hereto, of even or prior date, with respect to the subject matter hereof, and shall neither be modified in any manner nor shall it be cancelled at any time except by a written modification or cancellation agreement executed by duly authorized representatives of the Parties hereto

Signature	AERO DESIGN	DIRECT	DATE	TH
	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>

16. The Parties acknowledge and agree that LICENSOR's obligation to provide any Data and/or Proprietary Information under this Agreement is expressly subject to U.S. and/or Canadian export/import laws, rules and regulations as well as any other similar export/import controls requirements of any other jurisdiction ("Export/Import Laws"). If required, AERO DESIGN agrees to cooperate fully with LICENSOR to obtain such a license.

AERO DESIGN will not use, distribute, transfer or transmit any Data and/or Proprietary Information provided under this Agreement except in compliance with the applicable Export/Import Laws, specifically including, but not limited to, U.S. and Canadian laws and regulations prohibiting re-export of such Data and/or Proprietary Information to certain prohibited jurisdictions and restricted parties. In no event shall LICENSOR be obligated under this Agreement to provide access to or furnish any Data and/or Proprietary Information to any person except in compliance with applicable Export/Import Laws, policies and license conditions. In the event that LICENSOR is unable to secure such authorization or has determined in its sole discretion that the U.S. and/or Canadian Government will not issue such authorization, LICENSOR shall be entitled to terminate this Agreement. In the event of such termination, LICENSOR shall be excused from the obligation to deliver the Data and/or Proprietary Information and shall not be liable to AERO DESIGN for any loss, cost or expense arising from such non-delivery or termination (including any actual, consequential or other damages of any kind whatsoever). The sole liability of LICENSOR shall be to return any payments made by AERO DESIGN for such Data and/or Proprietary Information not delivered. The obligations stated above in this clause will survive the expiration, cancellation or termination of this Agreement or any other related agreement.

17. At the request of the Parties, this Agreement has been written in English only. À la demande des parties, ce contrat a été rédigé en anglais seulement.

The block contains handwritten signatures and stamps. On the left, there is a stamp with the text "AERO DESIGN" and a signature that appears to be "P.B.". To its right is a stamp with the text "LICENSOR" and a signature that appears to be "D.C.". Further right is a stamp with the text "BHTCL" and a signature that appears to be "J.M.". On the far right, there is a signature that appears to be "J.M.".

The Parties hereto have executed this Agreement, to be effective as of the Effective Date.

Bell Helicopter Textron Canada Limited

SIGNATURE: Isabelle Côté

NAME: Isabelle Côté

TITLE: Manager, Contracts

DATE: 8 JUNE 2012

Bell Helicopter Textron Inc.

SIGNATURE: Ignacio Socas

NAME: Ignacio Socas

TITLE: Principal Contracts Representative

DATE: 6/5/12

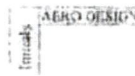
Textron Innovations Inc.

SIGNATURE: James Rumbold

NAME: James Rumbold

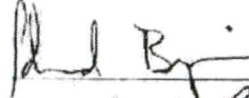
TITLE: President

DATE: 6/7/12



Aero Design Ltd.

SIGNATURE:



NAME:

EDWARD BURGOON

TITLE:

PRESIDENT

DATE:

31 MAY 2012

Amendment No. 1

To
Proprietary Rights License and Indemnity Agreement (PRLIA) No. BHTCL0963-00-COM

This Amendment No. 1 ("Amendment") to the PRLIA dated as of May 31, 2012, effective June 8, 2012 (the "Agreement"), is made as of this June 27, 2012, by and between Aero Design Ltd. (hereinafter "AERO DESIGN"), Bell Helicopter Textron Canada Limited (hereinafter "BHTCL"), Bell Helicopter Textron Inc. (hereinafter "BHTI") and Textron Innovations Inc. (hereinafter "TII"). BHTCL, BHTI, TII, and AERO DESIGN are individually referred to as a "Party" or collectively as the "Parties". BHTCL, BHTI and TII are referred to jointly as "LICENSOR".

WHEREAS, the Parties have entered into the Agreement for the Purpose (as such term is defined in the Agreement);

WHEREAS, the Parties have determined that data additional to that already provided under the Agreement is to be provided by LICENSOR to AERO DESIGN in support of the Purpose;

NOW THEREFORE, the Parties agree as follows:

1. Paragraph 2 of the Agreement is hereby deleted in its entirety and replaced with the following:

"2. LICENSOR agrees to provide AERO DESIGN with the following solely for the Purpose stated above:

- Dwg No. 429-030-080 (Passenger Step Installation);
- Dwg No. 429-030-108 (Fitting Assy);
- Dwg No. 429-030-400 (Cabin Floor Assy);
- Dwg No. 429-030-465 (FWD Quarter Frame Assy);
- Dwg No. 429-030-471 (Mid Lift Frame);
- Dwg No. 429-030-472 (Mid Quarter Frame);
- Dwg No. 429-706-074 (Passenger Step Kit and Provisions);

- Engineering Stress Analysis Report, including airframe loads relevant to basket design and installation; and
- All other data and/or Proprietary Information which the Parties may now or thereafter mutually agree to be necessary to AERO DESIGN for the Purpose.

Hereinafter collectively referred to as the "Data".

2. Capitalized terms not otherwise defined herein shall have the meanings respectively ascribed to them in the Agreement.
3. Except as set forth in this Amendment, the Agreement shall remain unmodified and in full force and effect.
4. This Amendment may be executed in two (2) or more counterparts, each of which shall be deemed an original document, and all of which, together with this writing, shall be deemed one instrument, and signatures transmitted by facsimile or in a PDF file shall be acceptable to bind each Party and shall not affect the validity of this Amendment in any way.
5. The Parties have agreed that this Amendment be drawn up in English. *Les parties ont convenu que le présent amendement soit rédigé en anglais.*

THE REMAINDER OF THIS PAGE HAS INTENTIONALLY BEEN LEFT BLANK.

RTB
J.C.

The Parties hereto have executed this Amendment No. 1, to be effective as of the date of its signing by the last Party to sign.

Bell Helicopter Textron Canada Limited

SIGNATURE: Isabelle Côté
NAME: Isabelle Côté
TITLE: Manager, Contracts
DATE: JUNE 27, 2012

Bell Helicopter Textron Inc.

SIGNATURE: [Signature]
NAME: IGNACIO SOCAS
TITLE: PRINCIPAL CONTRACTS REP
DATE: 6/27/12

Textron Innovations Inc.

SIGNATURE: [Signature]
NAME: James Hunsicker
TITLE: President
DATE: June 27, 2012

Aero Design Ltd.

SIGNATURE: [Signature]
NAME: EDWARD BURGOIN
TITLE: PRESIDENT
DATE: 27 JUNE 2012

sont précisées au sous-chapitre B du chapitre 516 —
Émissions des aéronefs du *Manuel de navigabilité*.

DORS/2009-280, art. 26.

Conformity with Certification Basis

521.33 An applicant for a type certificate in respect of an aeronautical product shall

- (a) demonstrate to the Minister that the aeronautical product conforms to the certification basis established by the Minister under section 521.30;
- (b) submit to the Minister a declaration attesting to the demonstration of conformity of the aeronautical product with its certification basis;
- (c) make available to the Minister the means by which conformity is established;
- (d) in the case of an aircraft, record the noise levels in its flight manual or in a supplement to that manual using the *Guidelines for the Administration of Noise Certification Documentation* set out in Attachment G of Annex 16, Volume I to the Convention; and
- (e) submit to the Minister for approval any manuals, instructions and limitations that are required by the certification basis established in respect of the aeronautical product.

SOR/2009-280, s. 26.

[521.34 to 521.43 reserved]

Inspections and Tests

521.44 An applicant for a type certificate in respect of an aeronautical product shall

- (a) ensure, before conducting a test, that the item to be tested conforms to the drawings, specifications and manufacturing processes proposed for the type design of the aeronautical product and that the measuring device and test equipment to be used are appropriate and calibrated for the test;

Conformité à la base de certification

521.33 Le demandeur d'un certificat de type à l'égard d'un produit aéronautique doit :

- a) démontrer au ministre que le produit aéronautique est conforme à la base de certification établie par celui-ci en vertu de l'article 521.30;
- b) lui présenter une déclaration attestant la démonstration de conformité du produit aéronautique à sa base de certification;
- c) mettre à sa disposition les moyens permettant d'établir la conformité;
- d) dans le cas d'un aéronef, consigner, dans son manuel de vol ou un supplément au manuel de vol, les niveaux de bruit en utilisant les *Lignes directrices pour l'administration des documents de certification acoustique* qui figurent dans le Supplément G de l'annexe 16, volume I de la Convention;
- e) soumettre à l'approbation du ministre les manuels, les instructions et les limites qui sont exigés par la base de certification établie à l'égard du produit aéronautique.

DORS/2009-280, art. 26.

[521.34 à 521.43 réservés]

Inspections et essais

521.44 Le demandeur d'un certificat de type à l'égard d'un produit aéronautique doit :

- a) avant de procéder à un essai, veiller à ce que l'article faisant l'objet de l'essai soit conforme aux plans et spécifications et aux méthodes de construction proposés pour la définition de type du produit aéronautique et à ce que le dispositif de mesure et l'équipement d'essai à utiliser soient appropriés et étalonnés pour l'essai;

- (b) ensure that the equipment and procedures used for conducting a test flight meet the requirements set out in sections 521.45 and 521.46;
- (c) conduct all the inspections, analyses and tests necessary to demonstrate to the Minister that the type design of the aeronautical product conforms to its certification basis;
- (d) in accordance with the certification plan, submit to the Minister for review the data and reports resulting from the inspections, analyses and tests conducted under paragraph (c); and
- (e) provide the Minister with access to the aeronautical product for the purpose of making any inspection, making any engineering assessment, or conducting or witnessing any test,
 - (i) required to verify the applicant's declaration attesting to the demonstration of conformity of the aeronautical product with its certification basis, or
 - (ii) required to make a determination of the conformity of the aeronautical product with its certification basis.

SOR/2009-280, s. 26.

Test Flights

521.45 (1) An applicant for a type certificate in respect of an aeronautical product who conducts a test flight shall

- (a) make provisions for emergency situations and provide the emergency equipment required for the safety of the test flight personnel;
- (b) conduct the inspections, analyses, structural tests, wind tunnel tests and functional tests of the critical systems and components of the aircraft used for the test flight — including an evaluation of the effect of their failure — to ensure that the aircraft will operate safely within the operating limitations and restrictions specified by the applicant;
- (c) provide a pilot who holds a licence endorsed with a rating appropriate for conducting the test flight; and

- b) veiller à ce que l'équipement et la procédure utilisés pour la tenue d'un vol d'essai soient conformes aux exigences prévues aux articles 521.45 et 521.46;
- c) procéder aux inspections, aux analyses et aux essais nécessaires pour démontrer au ministre que la définition de type du produit aéronautique est conforme à sa base de certification;
- d) conformément au plan de certification, présenter au ministre, aux fins d'examen, les données et les rapports découlant des inspections, des analyses et des essais effectués en application de l'alinéa c);
- e) lui donner accès au produit aéronautique pour procéder à toute inspection et à toute évaluation technique, ou procéder ou assister à tout essai, qui sont exigés :
 - (i) soit pour vérifier la déclaration qui est présentée par le demandeur et qui atteste la démonstration de conformité du produit aéronautique à sa base de certification,
 - (ii) soit pour déterminer la conformité du produit aéronautique à sa base de certification.

DORS/2009-280, art. 26.

Vols d'essai

521.45 (1) Le demandeur d'un certificat de type à l'égard d'un produit aéronautique qui effectue un vol d'essai doit :

- a) prendre des dispositions en prévision de situations d'urgence et fournir le matériel de secours exigé pour la sécurité du personnel du vol d'essai;
- b) procéder aux inspections, aux analyses, aux essais de structure, aux essais en soufflerie et aux essais de fonctionnement des composants et systèmes critiques de l'aéronef utilisé pour le vol d'essai — y compris une évaluation des conséquences de leur défaillance — pour veiller à ce qu'il soit utilisé en toute sécurité, compte tenu des limites et restrictions d'utilisation qu'il a indiquées;

Change Other than a Change to the Type Design

521.154 The holder of a design approval document who proposes to make a change to an aeronautical product, other than a change to the type design referred to in subsection 521.152(1), shall establish procedures to ensure that the changed aeronautical product continues to conform to its certification basis and make the change after the Minister accepts the procedures.

SOR/2009-280, s. 26.

Application for Approval of a Change to the Type Design

521.155 An applicant for the approval of a change to the type design of an aeronautical product shall submit to the Minister

- (a) an application that contains the information specified on the form published by the Minister entitled *Design Change Approval Application*;
- (b) a description of the change to the type design that identifies
 - (i) all parts of the type design, including all parts of the approved manuals, that are affected by the change, and
 - (ii) any re-investigations necessary to demonstrate the continued conformity of the aeronautical product with the applicable certification basis, by listing the standards of airworthiness that must be met and the means to be used to demonstrate conformity;
- (c) a proposed certification basis; and
- (d) a certification plan that identifies
 - (i) the means to be used to demonstrate that the change to the type design of the aeronautical product conforms to the applicable certification basis,
 - (ii) the documentation that demonstrates that the change to the type design of the aeronautical product conforms to the applicable certification basis, and

Modification autre qu'une modification de la définition de type

521.154 Le titulaire d'un document d'approbation de la conception qui se propose d'apporter une modification à un produit aéronautique autre qu'une modification de la définition de type visée au paragraphe 521.152(1) établit une procédure en vue de garantir que le produit aéronautique modifié continue d'être conforme à sa base de certification et apporte la modification après l'acceptation par le ministre de cette procédure.

DORS/2009-280, art. 26.

Demande d'approbation de modification de la définition de type

521.155 Le demandeur d'une approbation de modification de la définition de type d'un produit aéronautique présente au ministre :

- a) une demande qui contient les renseignements précisés dans le formulaire publié par le ministre et intitulé *Demande d'approbation de la modification de la conception*;
- b) une description de la modification à la définition de type qui indique :
 - (i) toutes les parties de la définition de type, y compris toutes les parties des manuels approuvés, qui sont visées par la modification,
 - (ii) le cas échéant, les réévaluations nécessaires pour démontrer que le produit aéronautique continue d'être conforme à la base de certification applicable, en énumérant les normes de navigabilité qui doivent être respectées, ainsi que les moyens à utiliser pour démontrer la conformité;
- c) une proposition de base de certification;
- d) un plan de certification qui indique :
 - (i) les moyens à utiliser pour démontrer que la modification de la définition de type du produit aéronautique est conforme à la base de certification applicable,

(iii) the resources necessary for carrying out the demonstration of conformity referred to in subparagraph (i), and

(iv) the schedule for carrying out the demonstration of conformity referred to in subparagraph (i).

SOR/2009-280, s. 26.

Effective Period of an Application

521.156 (1) Unless an applicant demonstrates, at the time of submitting an application for the approval of a change to the type design of an aeronautical product, that a longer period is required for the design, development and testing of the product, and for that reason the Minister approves a longer period, the application is effective during one of the following periods, beginning on the date of the application:

(a) five years, in the case of a transport category aeroplane or a transport category rotorcraft; or

(b) three years, in the case of

(i) an aircraft other than an aircraft referred to in paragraph (a),

(ii) an aircraft engine, or

(iii) an aircraft propeller.

(2) If a change to the type design of an aeronautical product is not approved within the applicable effective period referred to in subsection (1), the applicant may

(a) submit a new application for the approval of a change to the type design of the aeronautical product; or

(b) apply for an extension of the effective period of the original application.

(3) If the effective period of an application for the approval of a change to the type design of an aeronautical

(ii) la documentation qui démontre la conformité de la modification de la définition de type du produit aéronautique à la base de certification applicable,

(iii) les ressources nécessaires pour l'exécution de la démonstration de la conformité qui est visée au sous-alinéa (i),

(iv) l'échéancier de la démonstration de la conformité qui est visée au sous-alinéa (i).

DORS/2009-280, art. 26.

Période de validité d'une demande

521.156 (1) À moins que le demandeur ne démontre, au moment de présenter une demande d'approbation d'une de modification de la définition de type d'un produit aéronautique, qu'il faut plus de temps pour la conception, la mise au point et les essais de ce produit, et que le ministre n'approuve pour cette raison la prolongation, la demande est valide, à compter de la date de celle-ci, pendant l'une des périodes suivantes :

a) cinq ans, dans le cas d'un avion de catégorie transport ou d'un giravion de catégorie transport;

b) trois ans, dans le cas :

(i) d'un aéronef autre qu'un aéronef visé à l'alinéa a),

(ii) d'un moteur d'aéronef,

(iii) d'une hélice d'aéronef.

(2) Si une modification de la définition de type d'un produit aéronautique n'est pas approuvée pendant la période de validité applicable visée au paragraphe (1), le demandeur peut :

a) présenter une nouvelle demande d'une approbation d'une modification de la définition de type de ce produit aéronautique;

b) demander la prolongation de la période de validité de sa demande originale.

(3) Si la période de validité d'une demande d'approbation de modification de la définition de type d'un pro-

(2) An applicant for the approval of a change to the type design of an aeronautical product other than a restricted category aircraft shall demonstrate to the Minister that

(a) in the case of an aircraft, no feature or characteristic makes the aircraft unsafe, taking into account the category in which certification is requested; and

(b) the type design of the product provides a level of safety at least equivalent to that provided by the certification basis that applied before the change was undertaken.

(3) An applicant for the approval of a change to the type design of a restricted category aircraft shall demonstrate to the Minister that

(a) no feature or characteristic makes the aircraft unsafe when that aircraft is operated within the limitations specified for its intended use; and

(b) the aircraft has a type design that conforms to its certification basis.

SOR/2009-280, s. 26.

Issuance of Approval of a Change to the Type Design

521.161 Subject to section 6.71 of the Act, the Minister shall approve a change to the type design of an aeronautical product if the applicant meets the requirements set out in section 521.160.

SOR/2009-280, s. 26.

[521.162 to 521.200 reserved]

Division V — Supplemental Type Certificates

Application

521.201 This Division applies

(a) in respect of the issuance of a supplemental type certificate as a result of a change to the type design of an aeronautical product; and

(2) Le demandeur d'une approbation de modification de la définition de type d'un produit aéronautique autre qu'un aéronef de catégorie restreinte démontre au ministre :

a) dans le cas d'un aéronef, qu'aucun élément ni aucune caractéristique ne rend dangereuse l'utilisation de l'aéronef compte tenu de la catégorie pour laquelle la certification est demandée;

b) la définition de type du produit offre un niveau de sécurité au moins équivalent à celui assuré par la base de certification qui s'appliquait avant que la modification ne soit apportée.

(3) Le demandeur d'une approbation de modification de la définition de type d'un aéronef de catégorie restreinte démontre au ministre :

a) qu'aucun élément ni aucune caractéristique ne rend dangereuse l'utilisation de l'aéronef lorsqu'il est utilisé dans des limites précisées pour son utilisation prévue;

b) que l'aéronef possède une définition de type conforme à sa base de certification.

DORS/2009-280, art. 26.

Délivrance d'une approbation de modification de la définition de type

521.161 Sous réserve de l'article 6.71 de la Loi, le ministre délivre une approbation de modification à la définition de type d'un produit aéronautique si le demandeur se conforme aux exigences prévues à l'article 521.160.

DORS/2009-280, art. 26.

[521.162 à 521.200 réservés]

Section V — Certificats de type supplémentaires

Application

521.201 La présente section s'applique :

a) à la délivrance d'un certificat de type supplémentaire par suite d'une modification de la définition de type d'un produit aéronautique;

Jeff Clarke

From: Jim Tinson [jim@wingsengineering.ca]
Sent: February 7, 2014 10:08 AM
To: 'Jeff Clarke'
Subject: RE: WPN1402: Bell 429 Cargo Basket Changes to STC SH1258

Hello Jeff,

I also suggested that we remove the CPR-DR from the Project Summary.

For your project I recommend that it should be a "stand-alone" document and that you should reference this DAR 304 completed 959CPR-DR on the DCAA under Applicant's remarks. ✓

Please include an AD review with the PS and note that there are no ADs applicable to your installation or note how any applicable AD's have been addressed.

This is one of my unique TCCA-Pacific requirements however it does help to demonstrate the 601 design requirements. ✓
Normally in our engineering report.

In addition please update the DCAA remarks to read; "Delegate James Tinson, DAR 304 is providing an aircraft certification engineering review and will be making the findings of compliance and supplying a SOC for the items noted on the attached Compliance Program CP959-3a" ✓

I use the DCAA has my top application document and I use this box to demonstrate that I have met TCCA-Pacific's minimum application requirements.

See attached EPM page 24.

BTW I have yet to try out my new EPM.

and any other improvements that you would like.

Cheers

Jim Tinson FEC, PEng, DAR
T/F: 604.274.5647, C: 604.418.8955
WINGSENGINEERING.CA

17/02/2014

Jeff Clarke

From: Jim Tinson [jim@wingsengineering.ca]
Sent: February 7, 2014 9:35 AM
To: 'Jeff Clarke'
Subject: RE: WPN1402: Bell 429 Cargo Basket Changes to STC SH1258

Hello Jeff,

Notes from Wednesday's discussions regarding the following Aero Design Docs with a few extras.

95907_0draft.pdf, Bell 429 - S/N 57081 & Sub, External Attach Provisions

- Center step hole not used therefore it is plugged using item 06.

CP959_3a.pdf, Compliance Program

- Should reformat as a "Delta" CP where the original CP repeated with "no change" comments wrt unchanged compliance items. ✓
- Maybe update the Nature of Work to read; Basket Mounting Design Changes to suit S/N 57081 & Sub ✓

MOD959_2a.pdf, DCAA

- Put "Basket Mounting Design Changes to suit S/N 57081 & Sub" in front of See Project Summary PS959-1 followed by "for a complete description of required changes". ✓

PS959-1_0a.pdf, Project Summary

- Pg 1; Include "Basket Mounting Design Changes to suit S/N 57081 & Sub" as the first line for the Definition Of Change. ✓
- General; Include more evidence of the cooperative engineering relationship with Bell both for the original approval and the 57081 & Sub changes. ✓
- Pg 2; RH or LH i.e.; not both sides
[The Michel Brulotte info is excellent.] ✓
- Pg 5, 2nd Last Paragraph, Include the magnitude (+5% ?) of the reaction load change for slightly longer cantilevered arms and note the Pre Arm length vs. the Sub Arm length. ✓
- Pg 6, 3rd Paragraph, Note that the carbon panel is protected with a aluminum walk-way (?) provision and at this feature will be substantiated in the updated or delta engineering report number ER959-???? ✓
- Include a test plan description complete with a document reference number noting that the conformity/test plan will require TCCA-AC acceptance prior to completing the test plan. ✓

Revised Docs.pdf,

- Where are the updated/new engineering reports? ✓

My CAR 527/529 EPM Matrix pages are attached.

Please note that the Revision 4 bars are for items that are pending TC approval.

Cheers,

Jim Tinson FEC, PEng, DAR
 T/F: 604.274.5647, C: 604.418.8955
 WINGSENGINEERING.CA

17/02/2014

- f) DAR 304's actions wrt classification
- i) 521.153 Changes are beyond the current scope of this EPM.
 - ii) 521.154 Minor changes to existing approvals will follow EPM procedures noted in Section 2.4, Phase V: Post Certification Activities.
 - iii) 521.155 Applications for the initial approval will follow the Phase I thru IV procedures noted in this section and major changes to existing approvals will follow EPM procedures noted in Section 2.4, Phase V: Post Certification Activities.

2.3.3 Phase I: Application and Establishing Certification Basis, CAR 521.155 thru 159

- a) Phase I for Division IV of subpart 521 of the CARs generally consists of the following steps:
- i) Project initiation and familiarization between the applicant and TCCA;
 - ii) Submission of an application by the applicant for the change to the type design consisting of:

Per; SI 521-004, 6.1, (1) (b)	EPM Procedures / Forms / Templates
(i) Application form or alternate	TCCA DCAA Form 26-0469*
(ii) Description of change	Project Description document**
(iii) Proposed certification basis	Included in CP Part B
(iv) Proposed certification plan***	Included in CP Part C
Per; Key Elements Letter	
(v) Completed CRP-DR	Included in CP Part D as an "STC Only Requirement" [Recorded iaw SI 521-004, Appendix G]

* The Wings is typically the applicant or the agent for the applicant as noted on the DCAA.

** At least one relevant AD search will be included in DAR 304's Project Description application document.

*** The AC 521-002, Appendix A – Sample Certification Plan details are captured in the CP's Part C – Compliance Checklist and this checklist includes LOI and FOC sign-off/ completion provisions.

- iii) DAR 304 may file the application via the NDWL [where the NDWL system will provide a regional project number] or via email to the TTLE-P.
- iv) The TTLE-P will assign the project to an OPI and for an emailed application; the OPI will provide a regional project number to DAR 304 via email.
- v) Establishment of the certification basis by the Minister.
This is an iterative process between the OPI and DAR 304 that includes the assessment of both the proposed certification basis and the CPR Decision Record.

525	625	Fitting factors.	
		Personnel And Cargo Accommodations	
525	785	Seats, berths, safety belts, and harnesses.	
		SUBCHAPTER G – Operating Limitations and Information	
525	1529	Instructions for continued airworthiness	
		Markings and Placards	
525	1557	Miscellaneous markings and placards	
End of AWM 525			

AWM 527, Normal Category Rotorcraft			
CHAPTER	REQUIREMENT	PARAGRAPH TITLE	EXCEPTIONS
		SUBCHAPTER A - GENERAL	
527	1	Applicability.	
527	2	Special Retroactive Requirements	
		SUBCHAPTER B – FLIGHT – GENERAL	
527	29	Empty weight and corresponding center of gravity.	
		SUBCHAPTER C - STRENGTH REQUIREMENTS - GENERAL	
527	303	Factor of safety.	
527	305(a)(b)(1)	Strength and deformation.	
527	307(a)(b)(2)	Proof of structure	
		Flight Loads	
527	337 (a)	Limit manoeuvring load factor	
		Control Surface and System Loads	
527	397	Limit pilot forces and torques.	
		Emergency Landing Conditions	
527	561	General	
		SUBCHAPTER D - DESIGN AND CONSTRUCTION - GENERAL	
527	601	Design	
527	603	Materials.	
527	605 (a)	Fabrication methods.	
527	607	Fasteners.	
527	609	Protection of structure.	
527	611	Inspection provisions.	
527	613	Material strength properties and design values.	
527	619	Special factors.	
527	621	Casting factors.	
527	623	Bearing factors.	
527	625	Fitting factors.	
		Personnel and Cargo Accommodations	
527	771 (a) (b)	Pilot Compartment	
527	773	Pilot Compartment view	
527	785 (a) to (h)	Seats, berths, litters, safety belts, and harnesses.	
527	787	Cargo and baggage compartments.	
527	807	Emergency exits	
527	831 (a)	Ventilation	
		Fire Protection	
527	853	Compartment interiors.	
527	855 (a)	Cargo and baggage compartments.	
		External Loads	
527	865 (a) – (e)	External loads	

AWM 527, Normal Category Rotorcraft			
CHAPTER	REQUIREMENT	PARAGRAPH TITLE	EXCEPTIONS
		SUBCHAPTER E - Powerplant - General	Repair only
		Powerplant Fire Protection	Repair only
527	1191	Firewalls	Repair only
527	1193	Cowling and engine compartment covering.	
527	1194	Other surfaces	
		SUBCHAPTER F - Equipment - General	
527	1301	Function and installation.	<u>Limited to:</u> Non-required equip. Non-complex avionics Non-integrated avionics
527	1307	Miscellaneous equipment	
527	1309	Equipment, systems & installations	
527	1321	Arrangement and visibility	
527	1322	Warning, caution & advisory lights	
		Electrical Systems and Equipment	
527	1351	General	
527	1357	Circuit protection devices	
527	1361	Master switch arrangement	
527	1365	Electrical cables and equipment	
527	1367	Switches	
		Lights	
527	1381	Instrument lights	
		Safety Equipment	
527	1411	General	
527	1413	Safety belts	
		SUBCHAPTER G - Operating Limitations and Information	
527	1529	Instructions for continued airworthiness	
		Markings and Placards	
527	1557	Miscellaneous markings and placards	
		Rotorcraft Flight Manual and Approved Manual Material	
527	1589 (a)	Loading information	
End of AWM 527			

AWM 529, Normal Category Rotorcraft			
CHAPTER	REQUIREMENT	PARAGRAPH TITLE	EXCEPTIONS
		SUBCHAPTER A - GENERAL	
529	1	Applicability.	
529	2	Special Retroactive Requirements	
		SUBCHAPTER B - FLIGHT - GENERAL	
529	29	Empty weight and corresponding center of gravity.	
		SUBCHAPTER C - STRENGTH REQUIREMENTS - GENERAL	
529	303	Factor of safety.	
529	305(a)(b)(1)	Strength and deformation.	
529	307 (a)(b)(2)	Proof of structure	
		Flight Loads	
529	337 (a)	Limit manoeuvring load factor	
		Emergency Landing Conditions	
529	561	General	
		SUBCHAPTER D - DESIGN AND CONSTRUCTION - GENERAL	
529	601	Design	
529	603 (a)	Materials.	
529	605 (a)	Fabrication methods.	
529	607	Fasteners.	
529	609	Protection of structure.	

AWM 529, Normal Category Rotorcraft			
CHAPTER	REQUIREMENT	PARAGRAPH TITLE	EXCEPTIONS
529	611	Inspection provisions.	
529	613	Material strength properties and design values.	
529	619	Special factors.	
529	621	Casting factors.	
529	623	Bearing factors.	
529	625	Fitting factors.	
		Personnel and Cargo Accommodations	
529	785	Seats, berths, litters, safety belts, and harnesses.	
529	787	Cargo and baggage compartments.	
529	831 (a)	Ventilation	
		Fire Protection	
529	851	Fire Extinguishers	
529	853	Compartment interiors.	
529	855	Cargo and baggage compartments.	
		External Loads	
529	865 (a) – (e)	External loads	
		SUBCHAPTER E - Powerplant - General	
		Powerplant Fire Protection	
529	1191	Firewalls	
529	1193	Cowling and engine compartment covering.	
529	1194	Other surfaces	
		SUBCHAPTER F - Equipment - General	
529	1301	Function and installation.	
529	1307	Miscellaneous equipment	
529	1309	Equipment, systems & installations	
529	1321	Arrangement and visibility	Limited to:
529	1322	Warning, caution & advisory lights	
		Electrical Systems and Equipment	Non-required equip.
529	1351	General	
529	1353 (a) (b)	Electrical equipment and installations	Non-complex avionics
529	1355 (a)	Distribution system	
529	1357 (except b)	Circuit protection devices	Non-integrated avionics
529	1359	Electrical system fire and smoke protection	
		Lights	
529	1381	Instrument lights	
		SUBCHAPTER G - Operating Limitations and Information	
529	1529	Instructions for continued airworthiness	
		Markings and Placards	
529	1557	Miscellaneous markings and placards	
		Rotorcraft Flight Manual and Approved Manual Material	
529	1589 (a)	Loading information	
End of AWM 529			

AWM 533, Aircraft Engines			
CHAPTER	REQUIREMENT	PARAGRAPH TITLE	EXCEPTIONS
		Subchapter A General	Repair only
533	1	Applicability	Repair only
533	3	General	Repair only
533	4	Instructions for Continued Airworthiness	
533	5	Instruction Manual for Installing and Operating the Engine	
		Subchapter B Design & Construction : General	
533	11	Applicability	
533	15	Materials	
533	23	Engine Mounting Attachments and Structure	
End of AWM 533			

Background

Aero Design Ltd. has STC approvals and is in the business of fabricating and marketing External Cargo baskets for a variety of light and medium helicopters, including but not limited to the Bell Helicopter products 206B, 206L series, Bell 407, Bell 205A-1, Bell 212 and Bell 412. The designs for these products are the proprietary property of Aero Design Ltd. Aero Design Ltd. has a non-exclusive marketing agreement with Bell Helicopter's subsidiary company, Aeronautical Accessories Limited to sell its cargo basket products through the AAL catalogue.

Bell Helicopter approached Aero Design to design and build an external cargo basket for the Bell 429 model based on the existing designs of Aero Design products. The primary incentive for this development is supplying a cargo basket for Bell 429 Serial no. 66 to be delivered to Air Zermatt AG, Switzerland sometime in or around May 2012.

After inspecting the Bell 429 helicopter in Vancouver subsequent to the HAC convention in 2011, it was determined that the existing Aero Design 206L/407 quick detachable cargo basket could likely be fitted to the Bell 429 without modification. At that time Aero Design had one size of cargo basket for the 206L/407 but has subsequently added two (2) additional sizes and increased the allowable cargo load.

Proposed Design

Aero Design proposes using the existing 206L/407 quick detachable cargo basket to be fitted to the Bell 429 model. Custom attachments to interface between the existing cargo basket and the 429 helicopter structure will be designed, approved and fabricated by Aero Design.

The custom attachments will interface and use the existing Bell 429 passenger cabin access step mounting provisions. The spacing between the forward and aft 429 step mounting provisions by coincidence just happen to be approximately the same spacing as mounting provisions for the Aero Design 206L/407 cargo basket. Detailed confirmation of exact dimensions of the Bell 429 helicopter is still required.

The 206L/407 cargo basket is STC approved for a maximum load capacity of 300 lb. cargo. It is the design goal to maintain this cargo load limit when installed on the Bell 429 helicopter. The cargo basket load capacity will be determined by the structure of the Bell 429 passenger step provisions. Preliminary analysis done by Aero Design indicates that the Bell 429 structure may be limited to something less than 300 lbs of cargo. A preliminary loads analysis has been completed and submitted to Bell Helicopter, Airframe Structures, Mirabel for review (17 April 2012). Since the cargo basket will put some significant "limit load" conditions on the primary structure of the helicopter, involvement of Bell Helicopter airframe specialists in reviewing the loads and stress analysis is desirable, to avoid possible local airframe failures in service.

Project Costs

Defined costs

Design and build one (1) proto-type unit \$20,000

Includes the following:

- a) Designing and fabricating custom mounting
- b) Providing existing 206L/407 cargo basket
- c) Engineering documentation to substantiate regulatory compliance

Transport Canada fees 1,900

Undefined Costs:

- i) Aero Design travel expenses to/from Mirabel and/or other locations where a Bell 429 helicopter or parts may be situated to confirm the fit parts to the helicopter and participate in flight testing activities
- ii) External billings and fees paid by Aero Design in completing the work:
 - Transport Canada charges for conducting flight test
 - Engineering, data and flight test fees charged to Aero Design by Bell Helicopter
- iii) Helicopter time and fuel charges for conducting flight test.
- iv) "Company Pilot" time for conducting flight tests.
- v) EASA fees for issuing approval on basis of Transport Canada STC.

Note: Aero expenses billed out at cost plus 10% administrative.

Proposal

Aero Design will design and build custom mountings to install existing 206L/407 cargo basket onto a Bell 429.

Aero Design will substantiate regulatory compliance with the Basis of Certification for the 429 and have a Transport Canada STC issued.

Aero Design will apply for EASA approval on the basis of Canadian STC.

Aero Design will provide one complete installation with Transport Canada certification for installation on the Serial no. 66 Air Zermatt AG helicopter.

Aero Design will provide it's best efforts to complete the installation and approval on a schedule to be agreed between Aero Design and Bell Helicopter.

Bell Helicopter will provide the data listed in letter from Isabelle Cote, Manager Contracts, Bell Helicopter Textron Canada Limited, dated 20 April 2012, and any additional data that may be reasonably required to complete the project.

Bell Helicopter will provide access to a Bell 429 helicopter suitable for fitting up the installation to confirm correct installation and conformity.

Bell Helicopter will make arrangements to provide a Bell 429 helicopter and any required operational personnel for flight testing in accordance with a Transport Canada approved flight test plan.

Bell Helicopter will provide access to a Bell 429 flight step ass'y for installation on a pre-serial no. 80 helicopter to confirm fits and measurements.

Bell Helicopter will provide access to a Bell 429 flight step attachment fitting for a post-serial no. 81 helicopter to confirm fits and measurements.

Bell Helicopter will review cargo basket loads that are transferred to the helicopter structure and confirm sufficient design strength in the structure to support those loads.

Bell Helicopter will pay the full costs of both the "defined" and "undefined" costs listed above in the preceding section of this proposal.

Acceptance of Proposal

If you wish to proceed with this development project please issue a purchase order to Aero Design referencing this proposal.

AIR WORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

APPLICANT: Aero Design Ltd.
9888A Malaspina Road
Powell River, BC, Canada, V8A 0G3

DATE: 31 January 2014
REV. No.

CORRESPONDANCE TO:
(If other than applicant)

MAKE: Bell Helicopter
MODEL: 429

REGISTRATION: All Applicable
SERIAL No.: All Applicable

NATURE OF WORK: Installation of Side-Mounted External Cargo Basket - Basket Mounting Design Changes to suit S/N 57081 & sub.
This CP shows the paragraphs where demonstration of compliance has changed from TC accepted CP959, Rev. 2, indicated in column 2

MODEL CERTIFICATION BASIS: CAR527, Change 527-9

MODIFICATION CERTIFICATION BASIS: CAR527, Change 527-9

Airworthiness Requirement	Change from CP Rev. 2	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
Subpart B – Flight						
527.27	No	Centre of Gravity Limits	N/A			No change from Type Approval.
527.29	Yes	Empty Weight and Corresponding C of G	Data specified on inst'n drawing		X	Change: New configuration weight
527.51	No	Takeoff	Flight Test			Flight tests performed on Bell 429 by Transport Canada Flight Test and Bell Helicopters Test Pilot on instrumented helicopter. Tests remain valid for new configuration.
527.65	No	Climb: All Engines Operating	Flight Test			
527.67	No	Climb: One Engine Inoperative	Flight Test			
527.71	No	Gliding Performance	Flight Test			
527.75	No	Landing	Flight Test			
527.141	No	Flight Characteristics – General	Flight Test			
527.143	No	Controllability and Maneuverability	Flight Test			
527.171	No	Stability – General	Flight Test			
527.173	No	Longitudinal Stability	Flight Test			
527.175	No	Demonstration of Longitudinal Stability	Flight Test			
527.177	No	Static Directional Stability	Flight Test			
527.231	No	Ground and Water Handling - General	Flight Test			
527.241	No	Ground Resonance	Flight Test			
527.251	No	Vibration	Flight Test			
Subpart C – Strength Requirements						
527.301	No	Loads – Air Drag Loads	Analysis			

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

Airworthiness Requirement	Change from CP Rev. 2	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
527.301	No	Loads – Inertia Loads	Compliance with 527.337 and 527.561			
527.303	No	Factor of Safety	Analysis			
527.305	Yes	Strength and Deformation	Analysis and Test iaw AC 43.13-1B		X	
527.307	Yes	Proof of Structure	Analysis and Test iaw AC 43.13-1B		X	
527.337(a)	No	Limit Maneuvering Load Factor – Positive	Analysis and Test iaw AC 43.13-1B			Critical load factor in downward direction.
527.547	No	Main Rotor Structure	Flight Test			See comments for flight test above
527.561		Emergency Landing Conditions				
527.561(a)	No	General	N/A			Paragraphs (b)-(d) do not apply to this installation
527.561(b)	No	Structure Design	N/A			Not an item of mass inside the cabin that could endanger the occupants of the cabin
527.561(c)	No	Supporting Structure Design	N/A			Not an item of mass located above or behind the occupants of the cabin
527.561(d)	No	Fuselage Structure near fuel tanks	N/A			Not structure in the area of internal fuel tanks
Subpart D – Design and Construction						
527.601	No	Design	Specification on Drawings			Design is conventional.
527.603	Yes	Materials	Specification on Drawings		X	Materials used are specified in Mil-Hdbk-5J. Change: use of carbon fibre on lid and front end cover in place of aluminium.
527.605(a)	Yes	Fabrication Methods	Specification on Drawings		X	Design is conventional. Change: Procedure is required for making carbon fibre parts; procedure to be specified on drawings
527.609	No	Protection of Structure	Specification on Drawings			
527.611	No	Inspection Provisions	Specification on Drawings			Design is easy to inspect.
527.613	Yes	Material Strength Properties and Design Values	Values used as per Mil-Hdbk-5J		X	Change: Carbon fibre parts are non-structural covers, to be tested.
527.625	No	Fitting Factor	Analysis			
527.727	No	Reserve Energy Absorption Drop Test	Statement in Report			Installation does not exceed ground clearance required to meet reserve energy drop test as specified by Bell Helicopters.
527.783	No	Doors	N/A			Installation does not block doors.
527.787(a)	No	Cargo and Baggage Compartments	Compliance with 23.301 through 307			
527.787(b)	No	Cargo and Baggage Compartments	Design			Basket is a closed container.
527.787(c), (d)	No	Cargo and Baggage Compartments	N/A			Cargo is external to helicopter.

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

Airworthiness Requirement	Change from CP Rev. 2	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
527.807	No	Emergency Exits	N/A			Installation does not block doors.
527.865	No	External Load Attaching Means	N/A			Cargo basket is classified as a cargo compartment
527.1387	No	Position Light System Dihedral Angles	Statement			Position lights located on outboard sides of vertical fins on horizontal stabilizer. Basket installation does not extend outboard of vertical fins.
527.1401	No	Anti-collision Light System	Statement			Anticollision light located on top of vertical fin. Basket has no significant effect on visibility of anticollision light.
Subpart G – Operating Limitations and Information						
527.1505	No	Never Exceed Speed	Flight Test, Flight Manual Supplement			V _{NE} limited to 130 kts, established by flight test
527.1525	No	Kinds of Operation	Flight Manual Supplement			
527.1529	Yes	Instructions for Continuing Airworthiness	ICA Provided	X		
527.1557(a)	No	Miscellaneous Markings and Placards – Baggage Compartments	Placard provided		X	
527.1557(b)	No	Miscellaneous Markings and Placards	N/A			
527.1557(c)	No	Miscellaneous Markings and Placards	N/A			
527.1557(d)	No	Miscellaneous Markings and Placards	N/A			
527.1581	Yes	Rotorcraft Flight Manual – General	Flight Manual Supplement	X		Change: weight and balance
527.1583(c)	No	Operating Limitations – Weight and Loading Information	Flight Manual Supplement			
527.1585	No	Operating Procedures	Flight Manual Supplement			
527.1587	No	Performance Information	Flight Manual Supplement			
527.1589	No	Loading Information	Flight Manual Supplement & Placard			Placard installed on basket

CERTIFICATION PLAN

CP959.10

BELL 429

EXTERNAL CARGO BASKET MODIFICATION TO SUIT S/N 57081 & SUB.

Prepared by: Jeff Clarke, P.Tech.(Eng.)

Revision 0, 21 February 2014

Aero Design Ltd.



9888A Malaspina Road, Powell River, BC, V8A 0G3

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1.0 INTRODUCTION

This certification plan details the means and methods of compliance for the Airworthiness Requirements shown on Compliance Program CP959-1, Rev. 0 (Appendix A)

2.0 PERSONNEL

Applicant: Aero Design Ltd. – Jeff Clarke, P.Tech.(Eng.)

Delegate: James Tinson, DAR 304

Transport Canada: Jack Staal, PNR Region

3.0 CAR 527 SUBPART B - FLIGHT

3.1 527.29 – Empty Weight and Corresponding C of G

3.1.1 Means of Compliance

- a) Data specified on installation drawings
- b) Data specified in Instructions for Continued Airworthiness

3.1.2 Method of Compliance

Weight and balance information required to compute the aircraft empty weight and corresponding C of G with the cargo basket, cabin steps and mounting provisions installed is provided on each installation drawing as well as in the Instructions for Continued Airworthiness.

3.1.3 Compliance Documents, Data and Testing

- a) Installation drawings: 95901, 95902, 95905, 95906, 95907, 96901, 96902
- b) Instructions for Continued Airworthiness: ICA959.91 and ICA969.91

3.1.4 Schedule

Drawings and ICA to be submitted for Transport Canada review by 21 March 2014

3.1.5 Level of Delegation

Finding of compliance to CAR 527.29 delegated.

3.1.6 Level of Involvement

Review of installation drawings and ICAs.

3.2 527.51, .65, .67, .71, .75, .141, .143, .171, .173, .175, .177, .231, 241, .251, .547

3.2.1 Means of Compliance

- a) Flight Test

3.2.2 Method of Compliance

- a) Flight testing performed by Transport Canada flight test pilot Michel Brulotte and Bell Helicopters to determine Vne, performance information, acceptable controllability and stability over the flight envelope.

3.2.3 Compliance Documents, Data and Testing

Flight Test Report – prepared by Michel Brulotte, Transport Canada Flight Test Pilot

3.2.4 Schedule

N/A – Previous flight testing and report main applicable.

3.2.5 Level of Delegation

None – no change from original issue of STC

3.2.6 Level of Involvement

None – no change from original issue of STC

4.0 CAR 527 SUBPART C – STRENGTH REQUIREMENTS**4.1 527.301, .303, .305, .307, .337, .625****4.1.1 Means of Compliance**

- a) Analysis
- b) Load Test

4.1.2 Method of Compliance

- a) Using CAR 527.301, 527.303, 527.337, 527.625, develop the loads to be applied to the cargo basket installation.
- b) Perform analysis to demonstrate that the cargo basket, mounting beams, and attachments to the fuselage are capable of supporting the loads without deformation at limit load and without failure at ultimate load.
- c) For those parts where analysis may not be reasonably feasible, or where the standards require it, load test the parts/assemblies to demonstrate they are capable of supporting the loads without deformation at limit load and without failure at ultimate load.

4.1.3 Compliance Documents, Data and Testing

Engineering Report ER959.03

Test Plan and Report TR959.04

Test Plan and Report TR959.05

4.1.4 Schedule

Engineering Report ER959.03 – due 28 March 2014

Test Plan and Report TR959.04 and TR959.05 – submit for TC review by 07 March 2014, test by 14 March, TC review of results by 28 March 2014

4.1.5 Level of Delegation

Finding of compliance to 527.305 and 527.307 delegated.

4.1.6 Level of Involvement**Deliverable Transport Canada Level of Involvement**

TR959.04	Requires Transport Canada review and acceptance before test
TR959.05	Requires Transport Canada review and acceptance before test
Load Tests	Delegate to witness
TR959.04	Requires Transport Canada review and acceptance of results before Finding of Compliance
TR959.05	Requires Transport Canada review and acceptance of results before Finding of Compliance

5.0 CAR 527 SUBPART D – DESIGN AND CONSTRUCTION**5.1 527.601, .603, .605, .609, .611, .613****5.1.1 Means of Compliance**

- a) Specification on drawings
- b) Process specification on drawings

5.1.2 Method of Compliance

- a) Material specifications (MIL-, ASTM, etc.) on drawings. Material strength properties from specifications used in analysis.
- b) Process specification for lay-up of carbon fiber parts on drawings.

5.1.3 Compliance Documents, Data and Testing

Fabrication drawings – see Document Control List DCL959-11, DCL959-12, DCL959-15, DCL959-16

5.1.4 Schedule

Process specification – submit to TC for review by 14 March 2014

5.1.5 Level of Delegation

Finding of compliance to 527.603, 527.605(a), 527.613 delegated.

5.1.6 Level of Involvement**Deliverable Transport Canada Level of Involvement**

Process Specification Requires Transport Canada review and acceptance

5.2 527.727 – Reserve Energy Absorption Drop Test

5.2.1 Means of Compliance

- a) Statement in report

5.2.2 Method of Compliance

- a) Minimum ground clearance to comply with Reserve Energy Absorption Drop Test is supplied by Bell Helicopter, basket installation does not exceed this minimum clearance.

5.2.3 Compliance Documents, Data and Testing

Engineering Report ER959.01

5.2.4 Schedule

None

5.2.5 Level of Delegation

None – no change from original issue of STC

5.2.6 Level of Involvement

None – no change from original issue of STC

6.0 CAR 527 SUBPART G – OPERATING LIMITATIONS AND INFORMATION

6.1 527.1505, .1525, .1581, .1583, .1585, .1587, .1589

6.1.1 Means of Compliance

- a) Flight Manual Supplement provided

6.1.2 Method of Compliance

- a) Flight manual supplement includes operating limitations, operating procedures, performance information, and loading information.

6.1.3 Compliance Documents, Data and Testing

Flight Test Report – prepared by Michel Brulotte – contains performance information
Flight Manual Supplement FMS959.90, FMS969.90

6.1.4 Schedule

FMS959.90, FMS969.90 – submit to TC for review and approval by 28 March 2014

6.1.5 Level of Delegation

None

6.1.6 Level of Involvement

Deliverable	Transport Canada Level of Involvement
FMS959.90	Requires Transport Canada review and approval
FMS959.91	Requires Transport Canada review and approval

6.2 527.1529**6.2.1 Means of Compliance**

- a) Instructions for Continued Airworthiness provided

6.2.2 Method of Compliance

- a) Instructions for Continued Airworthiness are prepared in accordance with CAR 527 Appendix A

6.2.3 Compliance Documents, Data and Testing

Instructions for Continued Airworthiness ICA959.91

Instructions for Continued Airworthiness ICA969.91

6.2.4 Schedule

ICA959.91, ICA969.91 – submit to TC for review and approval by 28 March 2014

6.2.5 Level of Delegation

None

6.2.6 Level of Involvement

Deliverable	Transport Canada Level of Involvement
ICA959.91	Requires Transport Canada review and acceptance
ICA969.91	Requires Transport Canada review and acceptance

APPENDIX A

COMPLIANCE PROGRAM

CP959-1, REV. 0



Advisory Circular (AC)

Certification Plans

File No.	5009-6-500	AC No.	500-015
RDIMS No.	528332-V4	Issue No.	01
Issuing Branch	Aircraft Certification	Effective Date	2004-12-01

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1.0 INTRODUCTION

1.1 Purpose

The purpose of this Advisory Circular (AC) is to provide the aviation community with guidance on the development process, format, and content of a Certification Plan prepared for aeronautical product type certification, or modification and repair design approval activities.

Note:

Certification Plans are not required for those cases where the means and method of substantiating compliance are well understood and agreed to by both Transport Canada and the applicant. The need to develop a Certification Plan should be discussed with Transport Canada to determine if the complexity of substantiating compliance to a specific requirement warrants development of a Certification Plan.

1.2 Guidance Applicability

This document is applicable to all Transport Canada personnel, delegates and industry.

1.3 Description of Changes

This document, formerly AMA No. 500/15A is reissued as an AC. With the exception of minor editorial changes and updated references, the content is unaltered.

1.4 Termination

This document does not have a terminating action. It will however, be reviewed periodically for suitability of content.

2.0 REFERENCES

2.1 Reference Documents

It is intended that the following reference materials be used in conjunction with this document:

- (a) Chapter 505 of the Airworthiness Manual (AWM) – *Delegation of Authority*;
- (b) Chapter 511 of the AWM – *Approval of the Type Design of an Aeronautical Product*;
- (c) Chapter 513 of the AWM – *Approval of Modification and Repair Designs*;
- (d) Chapter 523-VLA of the AWM – *Very Light Aeroplanes*;
- (e) Chapter 523 of the AWM – *Normal, Utility, Aerobatic and Commuter Category Aeroplanes*;
- (f) Chapter 525 of the AWM – *Transport Category Aeroplanes*;
- (g) Chapter 527 of the AWM – *Normal Category Rotorcraft*;
- (h) Chapter 529 of the AWM – *Transport Category Rotorcraft*;
- (i) Advisory Circular (AC) 511-002 – *Type Certification Procedure for Canadian Aeronautical Products*;
- (j) Aeronautics Act;
- (k) FAA Advisory Circular (AC) 23-8A - *Flight Test Guide for Certification of Part 23 Airplanes*;
- (l) FAA Advisory Circular (AC) 25-7A - *Flight Test Guide for Certification of Transport Category Airplanes*;
- (m) FAA Advisory Circular (AC) 27-1B - *Certification of Normal Category Rotorcraft*; and
- (n) FAA Advisory Circular (AC) 29-2C - *Certification of Transport Category Rotorcraft*.

2.2 Cancelled Document

As of the effective date of this document, AMA No. 500/15A dated 10 June 2003 is cancelled.

2.3 Definitions

For this AC:

- (a) **Certification Plan** is a document that clearly identifies:
 - (i) the means and methods by which an aeronautical product will be shown to comply with the applicable airworthiness requirements, where the airworthiness requirements are typically identified in a compliance record document;
 - (ii) the agreed level of delegation granted to the applicant for each applicable requirement; and
 - (iii) the agreed level of involvement of certification team members (Transport Canada and Delegates) for each applicable requirement.
- (b) **Level of delegation** means the specific delegation granted to a Delegate, who has the appropriate scope of delegation to make a finding of compliance with a specific requirement (or set of requirements) and to approve the associated data;
- (c) **Level of involvement** means the specific involvement that Transport Canada specialists or Delegates will have when making a finding of compliance with a specific requirement (or set of requirements) and approving the associated data;
- (d) **Compliance record document** means a document prepared by the applicant, or the applicant's Delegate(s), which identifies the basis of certification, the method of compliance to be employed for each requirement, the referenced documentation used to substantiate the findings of compliance, and typically a signature area to be signed or initialled to signify findings of compliance and/or recommendations for findings of compliance for each requirement in the basis of certification. The Compliance record document is alternatively referred to as a compliance program document and as a compliance plan in the regulations or as a General Compliance Program (GCP);
- (e) **Aeronautical product** means an aircraft, aircraft engine, aircraft propeller, or aircraft appliance; and
- (f) **Delegate** means any person or corporation authorized under the authority of subsection 4.3(1) of the Aeronautics Act to perform functions on behalf of the Minister, subject to the conditions named in AWM Chapter 505.

3.0 BACKGROUND

The referenced airworthiness standards require that an applicant provide compliance record documentation that identifies the method of compliance and where this is documented for each requirement in the basis of certification. Certification project management and tracking activities are performed using documents such as the GCP, which is generally sufficient to establish the means of compliance and, to a certain extent, how compliance will be shown against the established basis of certification. The GCP served as an excellent tool to manage and document the certification process, to record findings of compliance or recommendations for findings of compliance, and approval of associated data through signature or initials of the appropriate specialists. Over time, however, the complexity of aircraft designs and the number of delegates involved in certification programs have increased whereas the time allotted to complete these projects has tended to be shortened.

The GCP has historically included codes signifying the means of compliance to be used to substantiate compliance with each requirement (i.e., T for Test, A for Analysis, etc.), but these codes provide little or no detail as to how this was to be accomplished. This lack of detail early in a project has resulted in misunderstandings between Transport Canada and applicants that did not become apparent until late in the project, becoming a serious impediment to meeting a

project's target dates and, in some cases, resulting in significant financial obstacles to the applicant.

Although there is usually considerable discussion to define the basis of certification near the start of a certification project and, in some cases, the basic means of compliance to be identified in the GCP (i.e., Test vs. Analysis), there is usually a lack of early detailed discussion on the applicable means of compliance and the associated methods of compliance. Consequently, there is usually limited or no formal documentation of these more detailed discussions and explanations of the methods of compliance that will be used. The objective of the Certification Plan is to promote detailed discussions on the means and methods of compliance between Transport Canada specialists and the applicant early in the project, and to document these discussions and agreements between Transport Canada and the applicant.

Through the identification and documentation of certification activities, it is possible to clearly identify the compliance documentation and activities to be completed to demonstrate compliance with the applicable requirements. Documentation of the detailed methods of compliance ensures that there is a record of agreements reached, which may assist an applicant in avoiding duplication of certification activities when obtaining foreign certification.

Early identification of division of responsibilities, expectations, documents, data and tests will clarify who has responsibility for approval of the type design and substantiating data. Additionally, information concerning all certification testing and compliance reporting can be consolidated into a single master schedule to provide visibility into resource allocation and the overall test-witnessing schedule.

3.1 Objective of a Certification Plan

The objective of a Certification Plan as a tool in the certification or approval process is to:

- (a) Improve overall communications and efficiency of the certification process;
- (b) Provide an early and clear understanding of expectations to achieve certification;
- (c) Provide information necessary to allocate resources;
- (d) Provide early identification of potential certification problems;
- (e) Optimize the certification process by agreement on the Certification Plan before involvement of other authorities (parallel certification process); and
- (f) Provide a documented record of agreements for the information of other authorities in consideration for foreign certification activities that could include preparation of issue papers or certification review items.

4.0 CERTIFICATION PLAN DEVELOPMENT PROCESS

4.1 Prior to starting development of a certification plan

Prior to starting development of a certification plan, Transport Canada and the applicant should:

- (a) Review the specific aeronautical product type certification, modification, or repair approval activity and related GCP to determine if a Certification Plan will be required for the project; and
- (b) Discuss the complexity of substantiating compliance to a specific requirement, or set of requirements, to determine if there is a need to develop a Certification Plan for those requirements. A Certification Plan may not be required for those cases where the means and method of substantiating compliance are well understood and agreed to between Transport Canada and the applicant through previous approval programs.

The format and content of the Certification Plan, identified in sections 5.1 and 5.2 below, should be discussed with Transport Canada. If the applicant is from a delegated organization, these plans should be prepared and/or reviewed by its Delegates prior to submission to Transport

Canada. Additional information on the tailoring of Certification Plans prepared for performance and flight characteristic requirements of the AVM is in section 6.0 below.

4.2 Preparation, review, and acceptance of Certification Plans

Preparation, review, and acceptance of Certification Plans may be accomplished using the process shown by the flowchart in Appendix A of this AC, and the following:

- (a) Transport Canada, the applicant and Delegates should discuss and agree on which requirements listed in the GCP require Certification Plans, the level of detail to be presented, and the general format of the Certification Plans (i.e., sequential paragraphs versus paragraphs grouped by subject area, etc.).
- (b) Transport Canada, the applicant and Delegates should discuss the means and methods of compliance to be used for each requirement. Mutual agreement should be reached on what information is critical to support the finding of compliance and should be contained in the Certification Plan.
- (c) The applicant and Delegates prepare the Certification Plan for each requirement, applicable to their functional specialty, to document the agreement reached in paragraph (b) above, using the information on content and format provided in section 6.0 below.
- (d) The applicant and Delegates should define what compliance documentation, data and testing will be required to support the agreed means and methods of compliance from paragraph (b) above.
- (e) The applicant and Delegates should develop a certification activity schedule for all documentation and data, and test activities where there is Delegate or Transport Canada participation identified in paragraphs (b) and (f).
- (f) The applicant shall provide Transport Canada with a copy of the draft Certification Plan and coordinate Certification Plan meetings as required with Transport Canada to review and discuss the plans. The draft Certification Plan may evolve through several subsequent meetings and throughout the life of the project.
- (g) Transport Canada should determine the level of delegation to be granted to the applicant's Delegates (if applicable) for each requirement, and shall specify Transport Canada's level of involvement in the defined documentation, data, or testing identified in paragraph (d) above. At this point, it is recommended that the applicant and the Delegates review the GCP to ensure it is consistent with the Certification Plan content. The expectation is that by the Initial Type Board the specialists should have prepared draft Certification Plans and reached agreement on the content.
- (h) Once agreement is reached on Certification Plan content, the applicant and Delegates shall revise the plan to reflect all agreed to changes to date, and provide it under cover letter to Transport Canada for acceptance. The cover letter will signify that the applicant's internal management agree with the Certification Plan contents. Transport Canada will respond by letter from the Project Management Division in Headquarters (HQ), or the responsible Regional Aircraft Certification office to indicate agreement with the Certification Plan at the appropriate revision status.
- (i) The applicant, Delegates and Transport Canada shall periodically review the Certification Plan and update the content and schedules as appropriate to reflect changes in agreement or technical direction that may occur. Changes should be identified to Transport Canada for concurrence if the applicant or Delegates make them.

5.0 FORMAT AND CONTENT

5.1 Essential elements

There is no mandatory presentation format for Certification Plans; however, Appendix B provides a simplified example for illustration purposes. Regardless of the appearance or format selected by the applicant, a useful Certification Plan contains five essential elements:

- (a) Identification of the requirement or group of requirements being addressed. Normally Certification Plans are developed for each requirement, or each group of requirements (by subject or specialty) applicable to the aeronautical product under consideration. For example, if one grouped AWM Chapter 525, Subchapter C - Structure requirements into a single Certification Plan it could be done sequentially by requirement, in groups (i.e., flight loads), or grouped by major components (i.e., landing gear);
- (b) A detailed explanation of the means and methods that will be used to demonstrate compliance;
- (c) A record of delegation identifying whether the finding of compliance, and approval or recommendation for approval of data substantiating compliance to the requirement, has been delegated or has been retained by Transport Canada;
- (d) Clear definition of the activities and documentation and data that will demonstrate compliance to the requirement; and
- (e) Clear identification of Transport Canada's and the Delegate's level of involvement, and the level of delegation to the applicants Delegates.

5.2 Content of a Certification Plan

The following provides an applicant with a more detailed explanation of the content of a Certification Plan:

- (a) The applicable requirement or set of requirements shall be identified;
- (b) The full requirement title shall be quoted. The full wording of the requirement should be presented to reduce misunderstanding of the content and to eliminate cross-reference to other documents, such as the GCP (i.e., the Certification Plan, although cross referenced on the GCP, shall be a self-explanatory stand alone document whose content is compatible with the information in the GCP);
- (c) The description of the means of compliance should explain the means by which compliance will be demonstrated, which should be fully spelled out (i.e., Flight Test, not FT), so that there is no potential for ambiguity (i.e., is FT flight test or functional test?). This is a repeat of what is documented in the GCP which typically uses codes that denote analysis, test, flight test, ground test, inspection, drawing review, or other agreed terminology. If multiple means are required to demonstrate compliance, then each specific means will be documented;
- (d) The detailed method of compliance used to show compliance will be an expansion of the information contained in the GCP. The level of detail to be presented for the method of compliance should be discussed between Transport Canada and the applicant, and should consider and document in the Certification Plan when required, the following:
 - (i) The specific (or worst case) conditions required to demonstrate compliance;
 - (ii) Any critical assumptions used;
 - (iii) The pass/fail criteria (applicable normally to "Test" as a means of compliance);
 - (iv) An explanation of what specific levels of performance a system or component must attain to be in compliance; and

- (v) Any other information considered important when describing how compliance is to be demonstrated.

Note:

Historically, the means of demonstrating compliance for Flight Test airworthiness requirements have been documented in the form of Test Definition Sheets (TDSs). The TDS describes in detail the means of compliance test methods and conditions, however, they are typically not ready in a time comparable to the Certification Plan. Recognizing that the TDS will provide a similar level of detail for the flight test airworthiness requirements as would be in a Certification Plan, and that Transport Canada Flight Test specialists will review the TDS in detail, it would be acceptable to use the TDS in place of the Certification Plan.

- (e) The applicant shall provide a full list of documents, data, and tests that will be used to demonstrate compliance with the requirement or group of requirements. This list shall include any activity to be completed (i.e., performance of a test) or any document to be prepared or in place (i.e., test report, compliance report, test plan, etc.);
- (f) The applicant may elect to include a schedule associated with the documents, data, or tests identified in subparagraph (v) above, to monitor for potential resource and schedule conflicts. It is the applicant's responsibility to periodically review and revise the schedules to make sure that they remain current and that any conflicts are resolved in a timely manner. If the applicant wishes, and Transport Canada agrees, the scheduling information may be provided in a separate document to simplify schedule planning and upkeep. If a separate document is used, a reference should be put in the Certification Plan to point to the document where the schedule information can be found;
- (g) The agreed level of delegation for each requirement or group of requirements shall be documented and clearly identify any stipulations, coordination requirements, or limitations placed on that delegation. This level of delegation will identify whether the finding of compliance, and approval or recommendation for approval of data substantiating compliance to the specific requirement, has been delegated to the applicant, or whether it has been retained by Transport Canada. If delegated to the applicant, the finding of compliance and approval of data is typically signified by the responsible Delegate signing or initialling against the requirement in the GCP. If not delegated, the responsible Delegate shall still sign or initial the GCP, but in this case as a recommendation for data approval. As far as the Certification Plan is concerned, a simple "Delegated, Yes/No" check box or equivalent adjacent to the specific requirement is all that is normally required to specify the agreed level of delegation;
- (h) The level of involvement of Transport Canada, the applicant, and Delegates is defined for each of the documents, data, or tests identified in paragraph (e) above, and this level of involvement shall be clearly recorded in the Certification Plan. This portion of the Certification Plan becomes the agreement between Transport Canada, the applicant, and the Delegate(s) on those activities the Transport Canada specialists and Delegate(s) shall complete before a finding of compliance can be made against the requirement. As such, the level of involvement describes a list of documents and data, as well as defining the work to be completed by Transport Canada and the Delegate(s) for each requirement; and
- (i) The level of involvement can be depicted in a "matrix format" as shown by the example in Appendix B of this AC. Each activity, such as the conduct of a test, completion of a report or assembling of data is listed. Transport Canada's and the Delegates' levels of involvement for each document, data or test can then be shown next to the activity. The example in Appendix A of this AC shows that even though the finding of compliance, and approval of the associated data used in substantiating compliance has been delegated, Transport Canada has decided to retain involvement in some activities, including review and acceptance of Test Plan #13 and #14, Rig Test witnessing, and review and

acceptance of Report 6A. This example illustrates that Transport Canada can still maintain involvement in activities leading to the finding of compliance where desired or required, but not have to make the actual finding. The level of detail that can be presented for each requirement using a level of involvement matrix ensures that Transport Canada, the applicant, and the Delegate(s) understand their respective expectations and obligations.6.0

6.0 FLIGHT TEST CONSIDERATIONS

For the performance and flight characteristics requirements of Subchapter B of AWM Chapter 5XX (i.e., 523, 523-VLA, 525, 527, and 529), the means of compliance is always a combination of flight test and analysis. The required flight tests change very little from program to program and the discussions which take place are normally at too detailed a level to be facilitated using a certification plan. Level of involvement is similarly discussed at the flight test point level (i.e., which specific test points is Transport Canada going to fly?).

6.1 Test Pilot Assessments for Subchapter B Requirements

For requirements of Subchapter B of AWM Chapter 5XX (i.e., 523, 523-VLA, 525, 527, and 529), to minimize the effort both to produce and to review the certification plans, it is acceptable to provide a reduced level of detail in the Certification Plan which could comprise:

- (a) The requirement;
- (b) A reference to associated advisory material, such as ACs, Joint Aviation Authorities (JAA) Advisory Circulars (ACJs), or specific paragraphs in system specific Advisory Circulars (ACs);
- (c) The specialty (Flight Analyst – Performance, Flight Analyst – Flight Characteristics, Test Pilot, or Systems Specialist);
- (d) Level of Delegation;
- (e) Report, Test Plan, and/or detailed test definition document listing, if desired; and
- (f) Transport Canada Flight Test level of involvement is normally defined by a standard list of certification test points and is specified in detail in the detailed test definition documents. Only if there are exceptions to the normal Transport Canada flight test program would Transport Canada's level of involvement be discussed in the Certification Plan.

This same format has been used for GCP's in the past except for the possible reference to level of involvement.

Exceptions to this simplified format may be advantageous when a non-standard situation exists because, for example, there has been a rule change, the manufacturer desires to use derivative data from a previous model, or it is proposed to use a means of compliance not listed in AC 25-7, 23-8, or paragraphs in ACs 29-2 or 27-1 dealing with flight tests. In this case the Certification Plan could be of use in obtaining early agreement for the general approach to substantiation of compliance.

6.2 Test Pilot Assessments for Non-Subchapter B Requirements

Currently, no means have been proposed to capture qualitative flight test aspects of the other subchapters, which may be documented in Certification Plans covering other disciplines. Given that it is impractical for the Flight Test Division to review Certification Plans for all disciplines in an attempt to pick out the flight test aspects, there is a need for a Certification Plan that summarises the proposed Non-Subchapter B flight tests in a format that can be reviewed with an acceptable level of effort. This Certification Plan should only include those tests that require a Test Pilot finding of compliance resulting from a subjective assessment of:

- (a) Level of skill;

- (b) Consistent operation;
- (c) Ease of operation;
- (d) Crew procedures;
- (e) Crew workload;
- (f) Inadvertent operation;
- (g) Continued safe flight and landing; or
- (h) Any other design feature requiring pilot judgment.

The preferred format of this listing would be by Air Transport Association (ATA) chapter numbering so that tests appropriate to any particular system could be easily located.

7.0 HEADQUARTERS CONTACT

For more information please contact:

Policy Standards Coordinator (AARDH/P)

Phone: (613) 990-3923

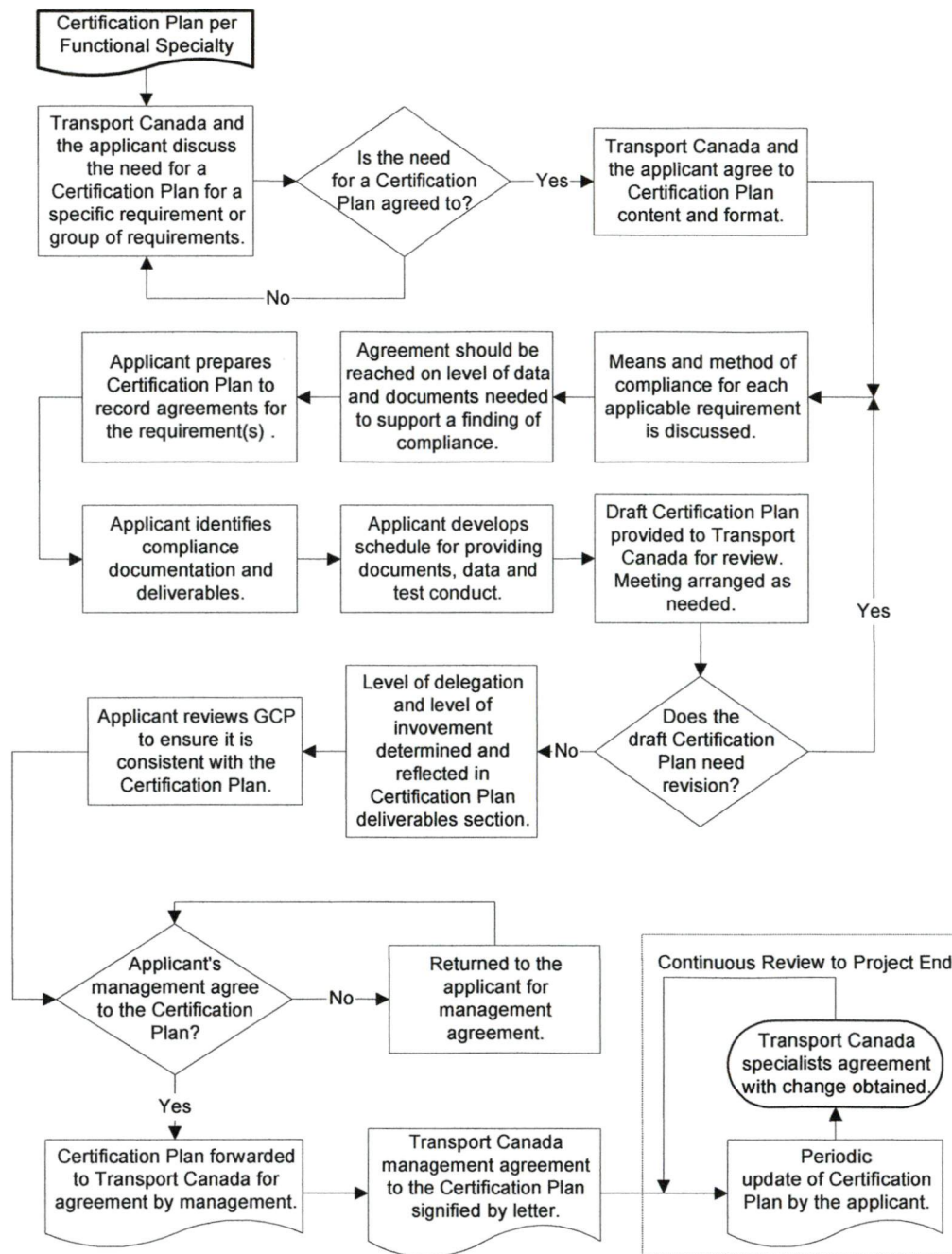
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Original signed by Maher Khouzam

M. Khouzam
Chief, Regulatory Standards
Aircraft Certification Branch

APPENDIX A - CERTIFICATION PLAN DEVELOPMENT PROCESS FLOWCHART



APPENDIX B - CERTIFICATION PLAN EXAMPLE

Prepared by:	Name / DAR #	Date Prepared:	Day Month Year
Checked by:	Name / DAR #	Page(s):	X of X
Title:		Issue No.:	X

REQUIREMENT: 25.955 - Fuel Flow

(a) Each fuel system must provide at least 100 percent of the fuel flow required under each intended operating condition and manoeuvre. Compliance must be shown as follows:

- (1) Fuel must be delivered to each engine at a pressure within the limits specified in the engine type certificate;
- (2) The quantity of fuel in the tank may not exceed the amount established as the unusable fuel supply for that tank under the requirements of Sec. 25.959 plus that necessary to show compliance with this section;
- (3) Each main pump must be used that is necessary for each operating condition and attitude for which compliance with this section is shown, and the appropriate emergency pump must be substituted for each main pump so used; and
- (4) If there is a fuel flow meter, it must be blocked and the fuel must flow through the meter or its bypass.

(b) If an engine can be supplied with fuel from more than one tank, the fuel system must:

- (1) For each reciprocating engine, supply the full fuel pressure to that engine in not more than 20 seconds after switching to any other fuel tank containing usable fuel when engine malfunctioning becomes apparent due to the depletion of the fuel supply in any tank from which the engine can be fed; and
- (2) For each turbine engine, in addition to having appropriate manual switching capability, be designed to prevent interruption of fuel flow to that engine, without attention by the flight crew, when any tank supplying fuel to that engine is depleted of usable fuel during normal operation, and any other tank, that normally supplies fuel to that engine alone, contains usable fuel.

MEANS OF COMPLIANCE:

- (a) Rig test; and
- (b) Flight test.

METHOD OF COMPLIANCE:

- (a) Engine requires 30 litres/min @ 15 P.S.I. minimum. See Installation Manual.
- (b) Critical fuel to be used in Rig test is JP4 @ -40 degrees C.
- (c) Minimum fuel to be tested was established at 36 litres. See FAR 25.959 report #6.
- (d) Critical attitude for fuel flow nose up 23.5 degrees. See attitude analysis contained in Report #17.
- (e) Rig test (Test Plan #13) to demonstrate flow rate for main and emergency pumps. Rig test will consist of a mock up of fuel system. See attached sketch all fittings, tube runs match production fuel system except: length of tube @ location x has no effect. See attached calculation/analysis.
- (f) Flight test to demonstrate fuel tank switching from tank 1 to 2. Engine @ cruise setting, altitude 25,000 feet. See test sequence (Test Plan #14).

Prepared by:	Name / DAR #	Date Prepared:	Day Month Year
Checked by:	Name / DAR #	Page(s):	X of X
Title:		Issue No.:	X

COMPLIANCE DOCUMENTS, DATA AND TESTING WITH SCHEDULE:

- (a) Report 6A (due Day Month Year)
- (b) Test Plan #13 (due Day Month Year)
- (c) Test (due Day Month Year)
- (d) Report 6B (due Day Month Year)
- (e) Test Plan #14 (due Day Month Year)
- (f) Flight Test (due Day Month Year)
- (g) Report 6C (due Day Month Year)

LEVEL OF DELEGATION:

Level of Delegation: Finding of compliance to FAR 25.955(a) delegated.

LEVEL OF INVOLVEMENT:

Level of Involvement Matrix:

<u>Deliverable</u>	<u>Transport Canada Level of Involvement</u>
Report 6A	Requires Transport Canada review and acceptance before Finding of Compliance
Test Plan #13	Requires Transport Canada review and acceptance before test
Rig Test	Transport Canada and Delegate to witness
Report 6B	Send for Transport Canada information only
Test Plan #14	Requires Transport Canada review and acceptance before test
Flight Test	Flight Test – Performance Delegate to witness
Report 6C	Requires Transport Canada review and acceptance before Finding of Compliance

[521.111 to 521.150 reserved]

Division IV — Changes to a Type Design

Application

521.151 This Division applies

- (a) in respect of the approval of a change to the type design of an aeronautical product; and
- (b) to applicants for an approval of a change to the type design of an aeronautical product.

SOR/2009-280, s. 26.

Change to a Type Design

521.152 (1) Subject to section 521.153, no person shall undertake a change to the type design of an aeronautical product that has other than a negligible effect on the weight and centre-of-gravity limits, structural strength, performance, power plant operation, flight characteristics or other qualities affecting its airworthiness or environmental characteristics except in accordance with sections 521.155 to 521.160.

(2) In any other case, no person shall undertake a change to the type design of an aeronautical product except in accordance with section 521.154.

SOR/2009-280, s. 26.

Change to a Type Design Requiring a New Type Certificate

521.153 An applicant for the approval of a change to the type design of an aeronautical product shall submit an application for a new type certificate under section 521.28 if the Minister determines that the change is so extensive in relation to the design, configuration, power or weight of the product — including, in the case of an engine, its power limitations — that a substantially complete investigation by the applicant is necessary to determine conformity with the applicable certification basis.

SOR/2009-280, s. 26.

[521.111 à 521.150 réservés]

Section IV — Modifications de la définition de type

Application

521.151 La présente section s'applique :

- a) à l'approbation d'une modification de la définition de type d'un produit aéronautique;
- b) aux demandeurs d'une approbation d'une modification de la définition de type d'un produit aéronautique.

DORS/2009-280, art. 26.

Modification de la définition de type

521.152 (1) Sous réserve de l'article 521.153, il est interdit d'apporter une modification à la définition de type d'un produit aéronautique qui a un effet non négligeable sur les limites de masse et de centrage, la résistance structurale, les performances, le fonctionnement du groupe motopropulseur, les caractéristiques de vol ou d'autres qualités ayant une incidence sur sa navigabilité ou sur ses caractéristiques environnementales, sauf en conformité avec les articles 521.155 à 521.160.

(2) Dans tout autre cas, il est interdit d'apporter une modification à la définition de type d'un produit aéronautique, sauf en conformité avec l'article 521.154.

DORS/2009-280, art. 26.

Modification de la définition de type exigeant un nouveau certificat de type

521.153 Le demandeur d'une approbation d'une modification à la définition de type d'un produit aéronautique présente une demande en vue de la délivrance d'un nouveau certificat de type en application de l'article 521.28 lorsque le ministre conclut que cette modification est d'une telle ampleur sur le plan de la conception, de la configuration, de la puissance ou de la masse de ce produit — y compris, dans le cas des moteurs, leurs limites de puissance — qu'elle nécessite une enquête quasi complète par le demandeur pour déterminer la conformité à la base de certification applicable.

DORS/2009-280, art. 26.

(b) to applicants for and holders of a supplemental type certificate in respect of an aeronautical product.

SOR/2009-280, s. 26.

Eligibility Requirements

521.202 An applicant for a supplemental type certificate in respect of a change to the type design of an aeronautical product shall have, or have access to, the technical capability to conduct the design analyses and tests required to demonstrate the conformity of the aeronautical product with its certification basis.

SOR/2009-280, s. 26.

Application for a Supplemental Type Certificate

521.203 Subject to section 521.153, an applicant for a supplemental type certificate in respect of a change to the type design of an aeronautical product for which the Minister has issued or accepted a type certificate shall submit an application to the Minister as specified in section 521.155.

SOR/2009-280, s. 26.

Certification Basis

521.204 The Minister shall establish, in respect of a change to the type design of an aeronautical product, a certification basis consisting of the applicable standards referred to in section 521.157.

SOR/2009-280, s. 26.

Conformity with Certification Basis

521.205 An applicant for a supplemental type certificate in respect of a change to the type design of an aeronautical product shall comply with the requirements set out in section 521.160 within the effective period referred to in section 521.156.

SOR/2009-280, s. 26.

b) aux demandeurs et aux titulaires d'un certificat de type supplémentaire à l'égard d'un produit aéronautique.

DORS/2009-280, art. 26.

Exigences d'admissibilité

521.202 Le demandeur d'un certificat de type supplémentaire à l'égard d'une modification de la définition de type d'un produit aéronautique possède les moyens techniques, ou a accès à des moyens techniques, qui lui permettent de procéder aux analyses et aux essais de conception exigés pour démontrer la conformité du produit aéronautique à sa base de certification.

DORS/2009-280, art. 26.

Demande de certificat de type supplémentaire

521.203 Sous réserve de l'article 521.153, le demandeur d'un certificat de type supplémentaire à l'égard d'une modification de la définition de type d'un produit aéronautique pour lequel le ministre a délivré ou a accepté un certificat de type lui présente une demande au ministre en la forme et de la manière prévues à l'article 521.155.

DORS/2009-280, art. 26.

Base de certification

521.204 Le ministre établit une base de certification à l'égard d'une modification de la définition de type d'un produit aéronautique, laquelle base est constituée des normes applicables visées à l'article 521.157.

DORS/2009-280, art. 26.

Conformité à la base de certification

521.205 Le demandeur d'un certificat de type supplémentaire à l'égard d'une modification de la définition de type d'un produit aéronautique doit se conformer aux exigences prévues à l'article 521.160 au cours de la période de validité visée à l'article 521.156.

DORS/2009-280, art. 26.

Issuance of a Supplemental Type Certificate

521.206 Subject to section 6.71 of the Act, the Minister shall issue a supplemental type certificate in respect of a change to the type design of an aeronautical product if the applicant complies with the requirements set out in section 521.205.

SOR/2009-280, s. 26.

Change to a Type Design Approved in a Supplemental Type Certificate

521.207 The holder of a supplemental type certificate in respect of an aeronautical product who proposes to make a change to the type design approved in the supplemental type certificate shall comply with the requirements set out in section 521.152.

SOR/2009-280, s. 26.

[521.208 to 521.250 reserved]

Division VI — Repair Design Approvals

Application

521.251 This Division applies

- (a) in respect of the issuance of a repair design approval as a result of a repair to an aeronautical product; and
- (b) to applicants for and holders of a repair design approval in respect of an aeronautical product.

SOR/2009-280, s. 26.

Eligibility Requirements

521.252 An applicant for a repair design approval in respect of an aeronautical product shall have, or have access to, the technical capability to conduct the design analyses and tests required to demonstrate the conformity of the aeronautical product with its certification basis.

SOR/2009-280, s. 26.

Délivrance d'un certificat de type supplémentaire

521.206 Sous réserve de l'article 6.71 de la Loi, le ministre délivre un certificat de type supplémentaire à l'égard d'une modification de la définition de type d'un produit aéronautique si le demandeur se conforme aux exigences prévues à l'article 521.205.

DORS/2009-280, art. 26.

Modification de la définition de type approuvée dans un certificat de type supplémentaire

521.207 Le titulaire d'un certificat de type supplémentaire à l'égard d'un produit aéronautique qui se propose d'apporter une modification à la définition de type approuvée dans ce certificat de type supplémentaire doit se conformer aux exigences prévues à l'article 521.152.

DORS/2009-280, art. 26.

[521.208 à 521.250 réservés]

Section VI — Approbation de la conception de réparation

Application

521.251 La présente section s'applique :

- a) à la délivrance d'une approbation de la conception de réparation par suite d'une réparation d'un produit aéronautique;
- b) aux demandeurs et aux titulaires d'une approbation de la conception de réparation à l'égard d'un produit aéronautique.

DORS/2009-280, art. 26.

Exigences d'admissibilité

521.252 Le demandeur d'une approbation de la conception de réparation à l'égard d'un produit aéronautique possède les moyens techniques, ou a accès à des moyens techniques, qui lui permettent de procéder aux analyses et aux essais de conception exigés pour démontrer la conformité du produit aéronautique à sa base de certification.

DORS/2009-280, art. 26.

- (c) aerobatic category;
- (d) commuter category;
- (e) transport category; or
- (f) restricted category.

(2) An applicant may, in the case of an aircraft for which no standards of airworthiness are listed in subsection 521.31(1), request a type certificate in respect of an aircraft category that is not listed in subsection (1).

SOR/2009-280, s. 26.

Application for a Type Certificate

521.28 An applicant for a type certificate in respect of an aeronautical product shall submit to the Minister

- (a) an application that contains the information specified on the form published by the Minister entitled *Type Certificate Application*;
- (b) a description of the aeronautical product that contains, in addition to its principal design features and its specifications,
 - (i) in the case of an aircraft, a three-view drawing, the preliminary data respecting the design and performance, and the proposed operating characteristics and limitations, and
 - (ii) in the case of an aircraft engine or propeller, a general arrangement drawing, and the proposed operating characteristics and limitations;
- (c) a proposed certification basis; and
- (d) a certification plan that identifies
 - (i) the means to be used to demonstrate that the aeronautical product conforms to the applicable certification basis,
 - (ii) the documentation that demonstrates the conformity of the aeronautical product with the applicable certification basis,

- b) catégorie utilitaire;
- c) catégorie acrobatique;
- d) catégorie navette;
- e) catégorie transport;
- f) catégorie restreinte.

(2) Le demandeur peut, dans le cas d'un aéronef pour lequel aucune norme de navigabilité n'est énumérée au paragraphe 521.31(1), demander la délivrance d'un certificat de type à l'égard d'une catégorie d'aéronef qui n'est pas énumérée au paragraphe (1).

DORS/2009-280, art. 26.

Demande d'un certificat de type

521.28 Le demandeur d'un certificat de type à l'égard d'un produit aéronautique présente au ministre :

- a) une demande qui contient les renseignements précisés dans le formulaire publié par le ministre et intitulé *Demande de certificat de type*;
- b) une description du produit aéronautique qui contient, outre ses caractéristiques de conception principales et ses spécifications, les éléments suivants :
 - (i) dans le cas d'un aéronef, un plan en trois dimensions, les données préliminaires en matière de conception et de performance, ainsi que les caractéristiques et limites d'utilisation proposées,
 - (ii) dans le cas d'un moteur ou d'une hélice d'aéronef, un plan d'agencement général, ainsi que les caractéristiques et limites d'utilisation proposées;
- c) une proposition de base de certification;
- d) un plan de certification qui indique :
 - (i) les moyens à utiliser pour démontrer la conformité du produit aéronautique à la base de certification applicable,
 - (ii) la documentation qui démontre la conformité du produit aéronautique à la base de certification applicable,

(iii) the resources necessary for carrying out the demonstration of conformity referred to in subparagraph (i), and

(iv) the schedule for carrying out the demonstration of conformity referred to in subparagraph (i).

SOR/2009-280, s. 26.

Effective Period of an Application

521.29 (1) Unless an applicant demonstrates, at the time of submitting an application for a type certificate in respect of an aeronautical product, that a longer period is required for the design, development and testing of the product, and for that reason the Minister approves a longer period, the application is effective during one of the following periods, beginning on the date of the application:

(a) five years, in the case of a transport category aeroplane or a transport category rotorcraft; or

(b) three years, in the case of

(i) an aircraft other than an aircraft referred to in paragraph (a),

(ii) an aircraft engine, or

(iii) an aircraft propeller.

(2) If a type certificate is not issued within the applicable effective period referred to in subsection (1), the applicant may

(a) submit a new application for a type certificate; or

(b) apply for an extension of the effective period of the original application.

(3) If the effective period of an application for a type certificate is extended under paragraph (2)(b), the standards of airworthiness applicable to the aeronautical product are those in force on the date that precedes, by one of the periods referred to in subsection (1), the date of the issuance of the type certificate.

SOR/2009-280, s. 26.

(iii) les ressources nécessaires pour l'exécution de la démonstration de conformité visée au sous-alinéa (i),

(iv) l'échéancier de la démonstration de conformité visée au sous-alinéa (i).

DORS/2009-280, art. 26.

Période de validité d'une demande

521.29 (1) À moins que le demandeur ne démontre, au moment de présenter une demande de certificat de type à l'égard d'un produit aéronautique, qu'il faut plus de temps pour la conception, la mise au point et les essais de ce produit, et que le ministre n'approuve pour cette raison la prolongation, la demande est valide, à compter de la date de celle-ci, pendant l'une des périodes suivantes :

a) cinq ans, dans le cas d'un avion de catégorie transport ou d'un giravion de catégorie transport;

b) trois ans, dans le cas :

(i) d'un aéronef autre qu'un aéronef visé à l'alinéa a),

(ii) d'un moteur d'aéronef,

(iii) d'une hélice d'aéronef.

(2) Si un certificat de type n'est pas délivré pendant la période de validité applicable visée au paragraphe (1), le demandeur peut :

a) présenter une nouvelle demande de certificat de type;

b) demander la prolongation de la période de validité de sa demande originale.

(3) Si la période de validité d'une demande de certificat de type est prolongée en application de l'alinéa 2b), les normes de navigabilité applicables au produit aéronautique sont celles en vigueur à la date qui précède, par l'une des périodes prévues au paragraphe (1), la date de délivrance du certificat de type.

DORS/2009-280, art. 26.



DESIGN CHANGE APPROVAL APPLICATION

DEMANDE D'APPROBATION D'UNE MODIFICATION DE LA CONCEPTION

Legal name and address of applicant Nom et adresse légal du demandeur	Legal name and address of prospective holder Nom et adresse légal du titulaire éventuel	Name and address for billing purposes (if different than applicant) Nom et adresse aux fins de facturation (si différent du demandeur)
Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada V8A 0G3	Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada V8A 0G3	

Identification of aeronautical product / Identification du produit aéronautique				
Make / Marque	Model / Modèle	Registration / Immatriculation	Serial No. / N° du série	Part No. / N° de la pièce
Bell Helicopter	429	All eligible	All eligible	

Request for (check appropriate box) / Objet de la demande (Cochez les carrés selon le cas)		Type Design Examination by Foreign Authority Examen de la définition de type par autorité étrangère
<input type="checkbox"/> STC CTS	<input type="checkbox"/> Repair Design Approval (RDA) Approbation de la conception de réparation (ACR)	<input type="checkbox"/> Application to a foreign authority is requested La demande à une autorité étrangère est demandée.
<input type="checkbox"/> STC (single serial number) CTS (numéro de série simple)	<input type="checkbox"/> Repair Design Approval - Process Repair ACR - Processus de réparation	
<input type="checkbox"/> STC (multiple serial numbers) CTS (numéros de série multiples)	<input type="checkbox"/> Part Design Approval (PDA) Approbation de la conception de pièce (ACP)	
<input type="checkbox"/> Type Certificate Revision Revision de certificat de type		
<input checked="" type="checkbox"/> Revision Révision	No. N° SH12-58 Current Issue Édition active 2	
<input type="checkbox"/> Restricted Category Catégorie restreinte		Identify Identifier

Type of Operation Type d'opération
Title and brief description of modification, repair or replacement part, including effects of changes (use additional pages if necessary). Refer to CAR 521.155(b)(i) for details. Titre et brève description de la modification, de la réparation ou de la pièce de rechange, y compris les effets des changements (utiliser des feuilles supplémentaires si nécessaire). Référez-vous à RAC 521.155(b)(i) pour des détails.
Cargo basket mounting design changes to suit S/N 57081 & sub, see project summary PS959-1 for a complete description of required changes.

Applicable Type Certificate (TC) / Certificat de type (CT) pertinent		
TC No. / N° de CT	Issue No. / N° de l'édition	Identify State of Design / Identifier l'état de conception
H-107	3	Canada

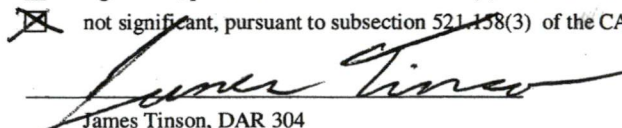
The applicant is responsible for the control of product manufacture / Le demandeur est responsable du contrôle de la fabrication du produit	
<input checked="" type="checkbox"/> Yes Oui	<input type="checkbox"/> No Non
If no, identify who is responsible Si non, identifier qui est responsable	

Documentation to be submitted Documentation à soumettre	Applicant Demandeur	
	Submitted Soumis	
	Yes Oui	No Non
Proposed certification basis Proposition de base de certification	✓	
Certification plan in accordance with CAR 521.155(d) Plan de certification selon RAC 521.155(d)	✓	

Applicant's remarks / Remarques du demandeur
Delegate James Tinson, DAR 304, is providing an aircraft certification engineering review, will be making findings of compliance and supplying an SOC for the items noted on the attached Compliance Program CP959-1 Rev. 0, and completing CPR Decision Record CPR-DR959.

I hereby certify that the information contained herein is correct and complete. I agree to pay charges as prescribed in Part 1, Subpart 4 of the CARs (CAR 104-Charges).	Je certifie que les renseignements figurant ci-dessus sont exacts et complets. Je m'engage à payer les redevances prescrites à la sous-partie 4 de la partie I du RAC (sous-partie 104 du RAC - Redevances).
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Jeff Clarke Name and Signature of Applicant / Nom et signature du demandeur	Vice President / P.Tech.(Eng.) Title / Poste	2014-02-20 Date (yyyy-mm-dd) / Date (aaaa-mm-jj)
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CHANGED PRODUCT RULE (CPR) DECISION RECORD		
NAPA No.:		
Step 1: Identify the proposed change to the aeronautical product. (Section 4.1 of AC 500-016)	The changes are detailed in the listed document(s): Project Summary PS959-1.	
Note: A G-1 Issue Paper <u>may</u> be required to track/document the decisions at Step 2 and Steps 5 through 8, and to detail the concluded certification basis.		
Step 2: Is the change substantial? (Section 4.2 of AC 500-016)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	A new type certificate is required. CPR Decision Process is Closed . Proceed to Step 3
Step 3: Will the latest standards be used? (Section 4.3 of AC 500-016)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Certification basis to use latest standards. Proceed to Step 8. Proceed to Step 4.
Step 4: Group changes into related and unrelated groupings. (Section 4.4 of AC 500-016)	You may need to define the project in the format of the AC's example for Step 4. Note: For multiple groupings, continuation of this process should be split to separate decision records.	
Step 5: Is the proposed change significant? (Section 5.0 of AC 500-016)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Proceed to Decision . Compliance may be shown to earlier standards. Certification basis to be defined and documented as indicated (below). Proceed to Step 8.
Decision: Will the latest standards be used?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Certification basis to use latest standards. Proceed to Step 8. Proceed to Step 6, addressing each area separately (see below).
Identification of Affected Areas:	The area(s) affected by the proposed change have been detailed in Certification Plan document number(s):	
Step 6: Is this area affected by the proposed change? (Ask for each area) (Section 6.1 of AC 500-016)	<input type="checkbox"/> Yes <input type="checkbox"/> No	Proceed to Step 7. Compliance with the latest standards is not required. Compliance may be continued to be shown with the existing certification basis.
Step 7: Do the latest standards contribute materially to the level of safety and are they practical? (Section 6.2 of AC 500-016)	<input type="checkbox"/> Yes <input type="checkbox"/> No	Certification basis to be established using latest standards. Compliance with the latest standards is not required. Compliance may be shown to earlier standards. Certification Basis defined or documented as indicated in below. Note: Several standards may apply to each area and the assessment may differ from standard to standard. Indicate Yes if compliance with any latest standard(s) will be required. Indicate No only if earlier standards are to be applied.
<input type="checkbox"/> Continuation Sheet(s) Attached		
Note: A delegate may develop a proposal for the Yes/No decision of Step 7. TCCA will make the final determination.		
Step 8: Is the proposed Basis of Certification Adequate? (Section 8.0 of AC 500-016)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Stop! CPR Decision Process is Closed. Determination of Certification Basis is Complete! Basis of certification may require later airworthiness standards or Special Conditions – Consult TCCA.
Certification Basis	The certification basis is as follows or as detailed in the listed document(s): Bell 429, TCDS H-107, Issue 3: Airworthiness Manual Chapter 527, including at Change 527-6, including Appendix B for IFR and Appendix C for Category A. Appendix C specifies certain sections of AWM Chapter 529. For these specified sections, AWM Chapter 529 at Change 529-6 is applicable.	
Under the delegated authority, I have examined the change in type design listed above according to established procedures and hereby determine, to the best of my knowledge and belief, that it is. (check one)		
<input type="checkbox"/> substantial, pursuant to section 521.153 of the CARs <input type="checkbox"/> significant, pursuant to subsection 521.158(3) of the CARs <input checked="" type="checkbox"/> not significant, pursuant to subsection 521.158(3) of the CARs		
 James Tinson, DAR 304		FEB 20 2014 Date

Title: Quick Release Cargo Basket

Approval: STC

Manufacture: Mfd by Aero Design (amend Approved Product List)

Customer: Aero Design Ltd.

Type and Model: Bell 429

Definition Of Change:

Basket mounting design changes to suit S/N 57081 and subsequent.

Description:

Original configuration - rotorcraft S/N 57080 and previous

In 2011, Aero Design was contacted by Bell Helicopters to design and build an external cargo basket for an operator in Europe to be used on an aircraft in support of heli-skiing and search and rescue operations. Bell Helicopters provided access to aircraft for test fitting and flight testing, as well as engineering support to confirm loads due to the basket on the fuselage attachments would not exceed established allowables.

The cargo basket mounting provisions are installed on the cabin step provisions located on the outside of the fuselage below the main cabin door. The original step was installed with aluminum fittings on the outside of the fuselage, 3 per side, with bolts installed through integral-reinforced sections of the flanges of the fuselage frames.

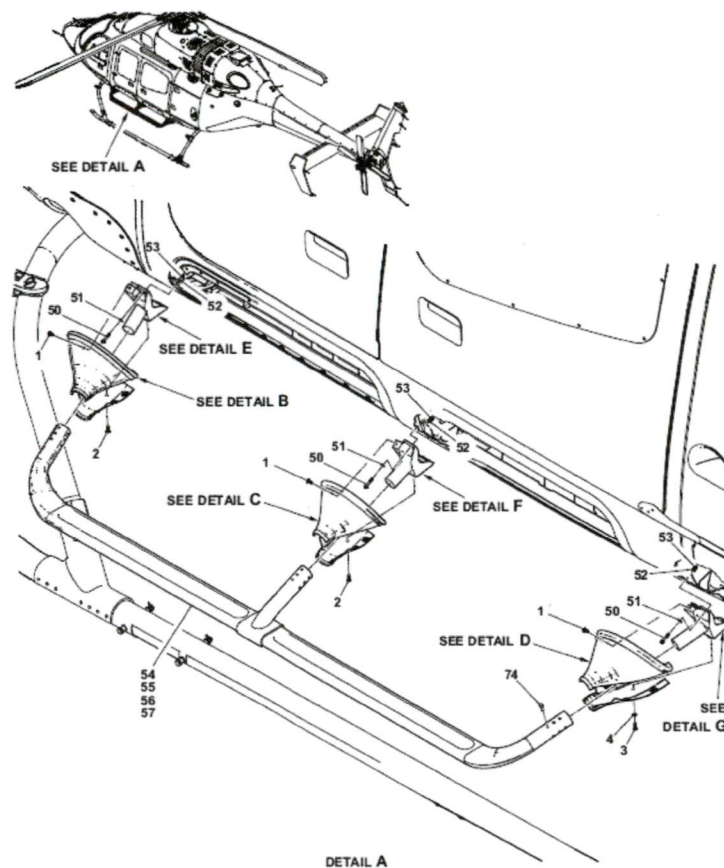


Figure 1 - Bell 429 Cabin Step Installation

The cargo basket mounting provisions use the forward and aft step positions on both sides, and installs fittings on the outside of the fuselage with bolts through the reinforced flanges of the frames, the same as the step. Support beams are then attached to the fittings with aluminum plates. The basket is installed on the support beams using the existing Aero Design quick release system, which consists of a seat track type fitting that slides into keyways and is retained with a spring loaded pin. The provisions are "sided"; the basket can only be installed on the right or left side of the helicopter with the correct provisions installed. There is no way to install a basket on both sides with the existing mounting provisions.

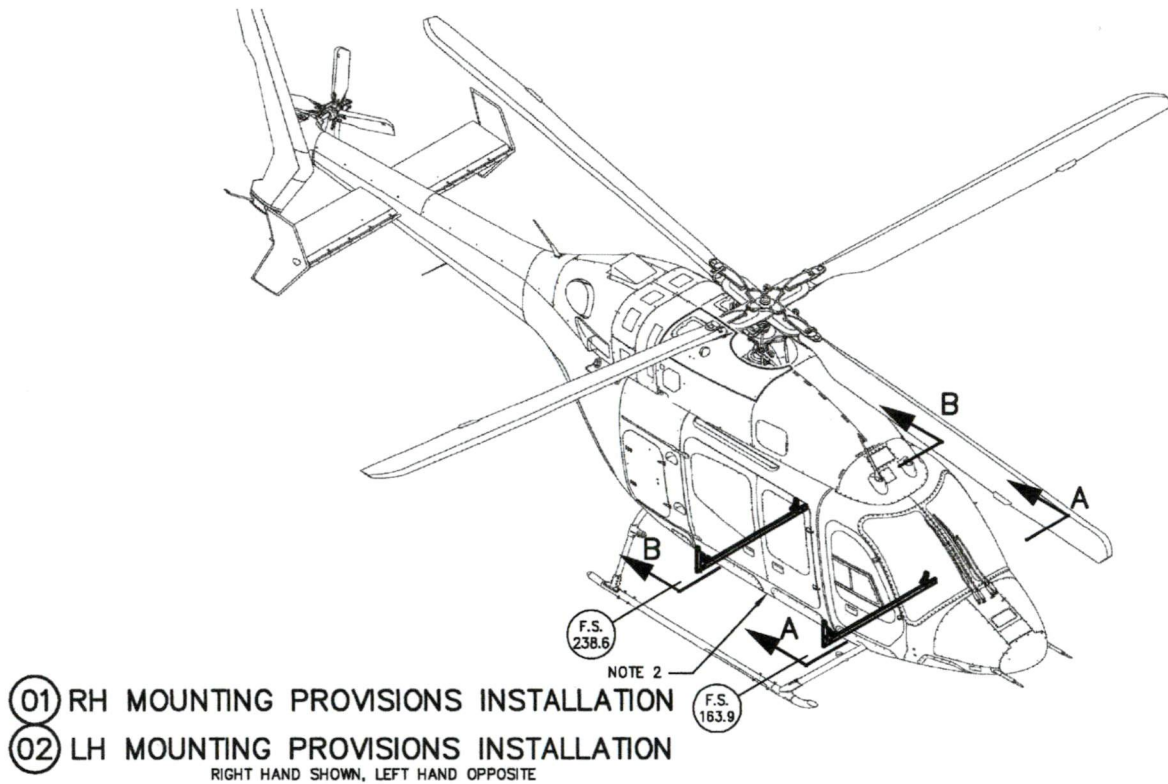


Figure 2 – Cargo Basket Mounting Provisions Installation
 (Right hand or left hand, not both)

The centre of gravity of the cargo and basket are farther outboard than loads applied to the step, but because the basket is supported on both sides of the helicopter the bending moment and reaction loads applied to the fuselage are no higher than those applied by passengers using the step with the load factors specified by Bell.

The basket and mounting beams were load tested to demonstrate they are capable of supporting a cargo load of 300 lbs, at the critical load conditions. The attachment fittings were demonstrated to support the loads by analysis. Bell Helicopters provided a report to confirm the reaction loads due to the basket installation on the fuselage attachment points do not exceed the reaction loads due to the occupants of the step in the critical condition defined by Bell.

The mounting provisions and cargo basket were installed on an instrumented flight test helicopter and flight tested by Bell Helicopters at Mirabel, QC, with Transport Canada flight test pilot Michel Brulotte, to determine the flight limitations.

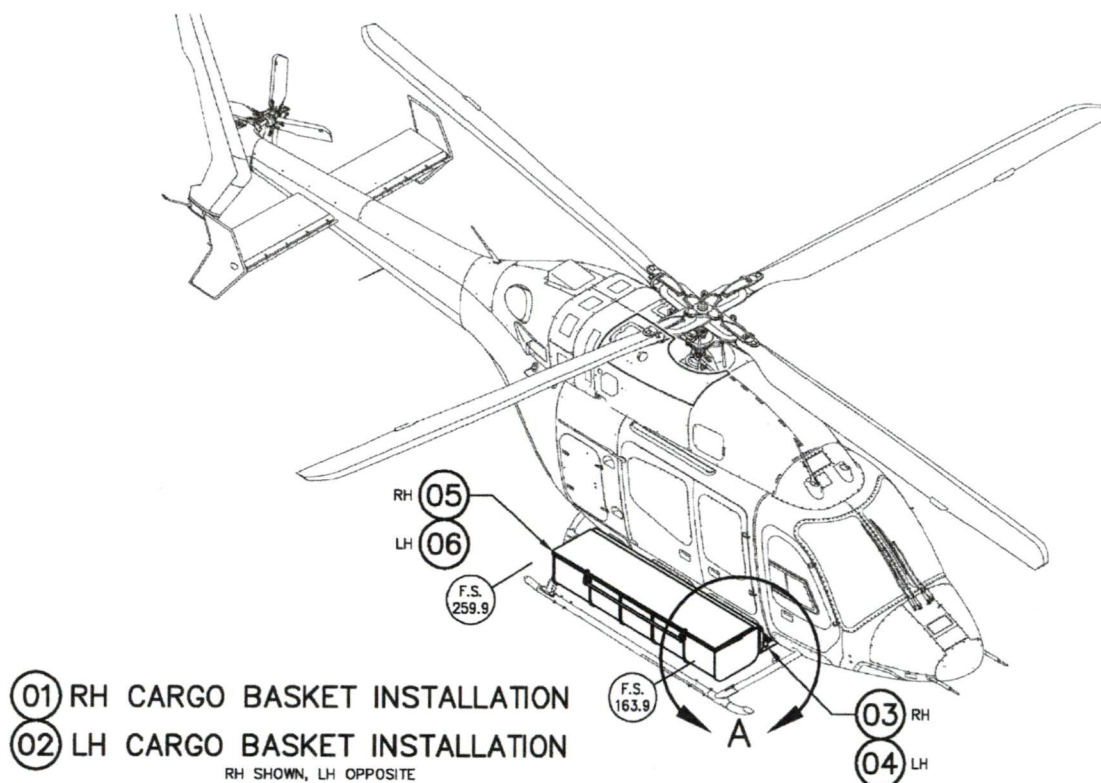


Figure 3 – Cargo Basket Installation
 (Right hand or left hand, not both)

The basket assembly consists of a tubing structure lined with expanded steel mesh, as used on all Aero Design baskets. The structure is 4130 steel square tubing, 0.5 x 0.035 wall "hoops" and 0.75 x 0.035 wall "rims", with the aft attachment hoop using 1.0 x 0.065 tube, reference drawing 95911 for assembly details. The heavier tube is used to support the bending moment applied by the cargo through the basket frame; it is not required on the forward end because of a strut connecting the upper outboard corner and the lower inboard attachment. This is the same arrangement used on many other Aero Design baskets.

Early flight testing by Bell Helicopters determined that airflow through the basket caused vibration in the tailboom in some conditions at higher speeds, which were solved by making the lid and front end solid. As such, the approved lid assembly differs from the typical Aero Design configuration (0.75" tube rim and bracing with expanded mesh on the inside), and is instead covered with aluminum checker plate riveted to the rim instead of expanded mesh. The forward end of the basket is covered with a flat aluminum sheet, riveted to the hoop and rim, instead of expanded mesh.

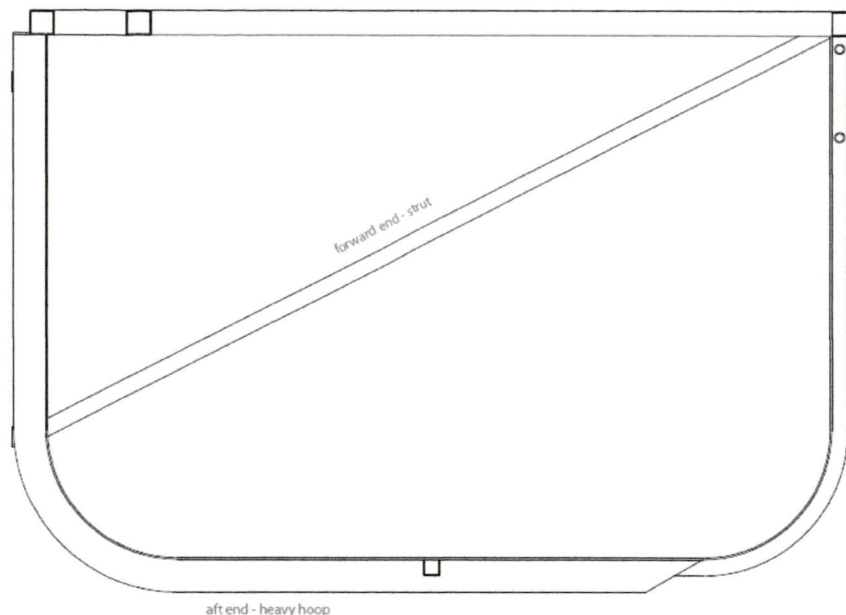


Figure 4 – Basket cross-section showing supports

The mounting beams are all stainless steel, primarily 1 x 2 x 0.125 wall rectangular tube. Keyways are machined into the outboard faces, and the latching mechanism is built into the aft beam. The keyways are arranged with a horizontal slot on the forward beam, which bottoms out as drag is applied to the basket, and vertical slot on the aft beam. The arrangement of horizontal and vertical allows for any minor twisting of the fuselage (usually caused by the landing gear on uneven surfaces or varied loading conditions in the helicopter) or a deviation in attachment spacing on the fuselage to be accommodated without twisting the basket to engage all of the keyways. The same arrangement is used on Aero Design AS350 and R44 baskets.

Cabin steps were added as an optional configuration shortly after the basket installation was approved. There is a fixed step that is installed on the opposite side to the basket, and a quick release step that is installed on the basket provisions when the basket is removed.

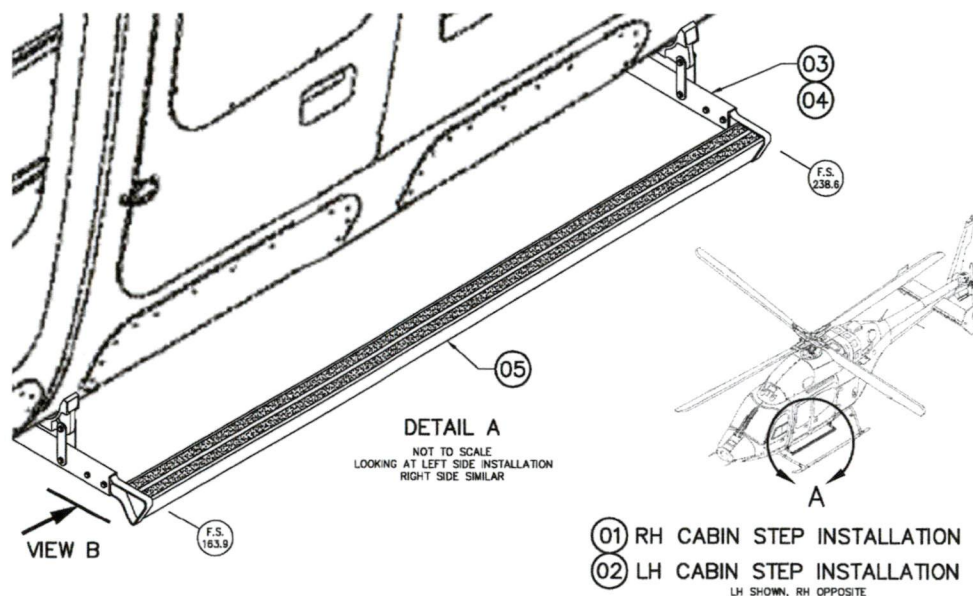


Figure 5 – Fixed Cabin Step Installation

The steps are located in the same position (laterally and vertically) as the original steps provided by Bell. These configurations were approved by Transport Canada and EASA as optional configurations on the approval document. When the approval was reviewed by the FAA, a determination was made that the steps cannot be optional because the original, type certified, aircraft is fitted with the steps and thus steps are required to provide equivalent access to/from the cabin. The FMS was revised to make the steps mandatory, but this is not reflected in the current TC or EASA STC documents. This is to be revised on this re-issue.

New configuration – rotorcraft S/N 57081 and subsequent

In 2013, Bell Helicopters contacted Aero Design to produce a basket suitable for later serial number 429 rotorcraft. Starting at S/N 57081, Bell implemented a “cost and weight reduction program” on the 429. This resulted in a number of structural changes, including the attachment of the cabin step. Where the original configuration used fittings attached to the outside of the fuselage, the new configuration changed the step attachment to a socket arrangement attached to the web of the fuselage frames. This change shifts the forward and aft attachment points used for the basket mounts approximately 1.5” forward.

The altered configuration requires new attachment fittings that are inserted into the existing sockets for the steps. It is not feasible to maintain the original attachment positions. The new fuselage attachment points are inboard of the original configuration.

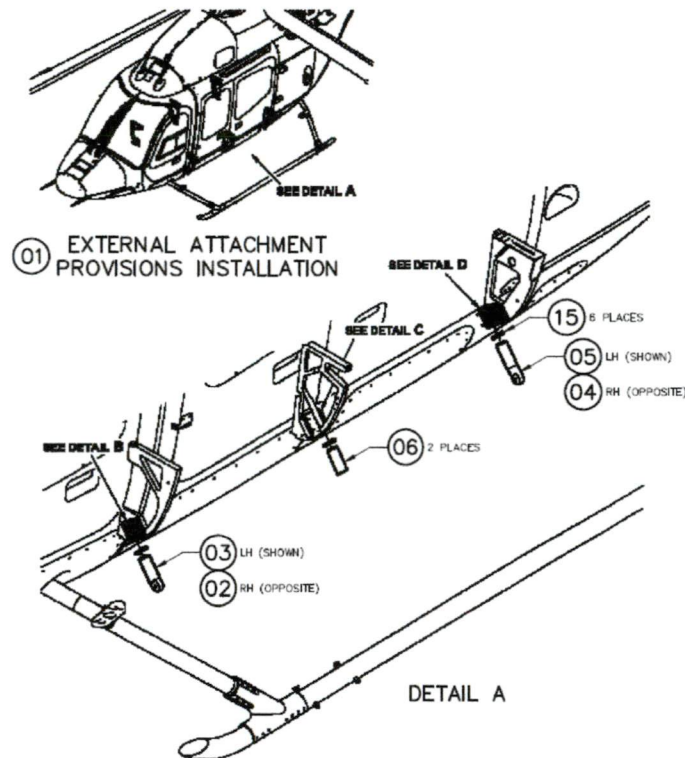


Figure 6 – New Attachment Provisions

The mounting beams must be slightly modified to shift the attachment points to accommodate the new position. The basket is cantilever out from the attachment points, therefore the reaction loads are increased due to being closer together. The increase in load is approximately 5% and the arm is 1.7 inches longer (1676 lbs @ B.L. 27.8 vs. 1756 lbs @ B.L. 26.1). There was no permanent deformation found in the mounting beams at ultimate load for the original configuration, therefore there will not be failure at due to the increase. There are no other changes to the mounting beams.

The basket assembly remains largely unchanged, however the shift of the attachments requires the forward end of the basket to be joggled to provide clearance from the forward cross tube during installation and removal of the basket. The original configuration was somewhat tight to the crosstube as the basket rotates forward as part of the installation/removal procedure, and Bell Product Support Engineering expressed some concern about the possibility of the basket touching the gear on installation and removal as the manufacturing process for the cross tube allows for a small tolerance for scratches and damage. As such, there is an abrasion strip required as part of the original installation to protect the cross tube. Aero Design makes a 1.75" joggle on the aft end of the approved Bell 206L/407 cargo baskets, so there is already a procedure to make the required joggle. It would be very difficult to make the forward end out of aluminum sheet per the original configuration, due to the angles and radii of the joggle. Instead of flat aluminum sheet, a carbon/Kevlar composite panel formed to fit the joggle is used. The end covering is not structural, as the strut transfers loads from the outboard rim down to the lower attachment; it is only required to close the end in.

The lid of the basket differs in that a carbon composite panel is used in place of the aluminum checker plate. The carbon composite panel is installed on the inside of the lid, using rivets and Pro-Seal adhesive, and is protected from the top with an aluminum tread plate walkway on the outside of the lid, in accordance with Aero Design modification 70405, approved on most other models of cargo basket. The lid will be demonstrated to restrain the cargo under the negative maneuvering load condition. The lid structure remains the same as previously approved.

The steps do not require any changes, but the weight and balance must be updated to reflect the shift forward, and as such the installation will get a new P/N.

Primary Changes to the Aeronautical Product:

Removal of cabin steps on both sides; Installation of attachment fittings, installation of mounting beams, installation of cargo basket

Secondary Changes to the Aeronautical Product (Required as consequence of primary changes):

None

Other Relevant Modifications to the Aeronautical Product (Which impact on this change):

None

Test Plans:

Two structural load tests will be required to demonstrate compliance with the proof of structure requirement. The test plans and conformity of the test articles will require TCCA-AC acceptance prior to conducting the tests.

Test 1 – Attachment Fitting

Test Plan and Report TR959.04 will be used to document the test plan and subsequent reporting on the test of the fuselage attachment fitting. The socket fitting described above sits at a compound angle and would be difficult to analyse under the combined loading conditions required. The proposed test would involve using a representative fitting (without the compound angles) that is pulled to simulate the critical vertical (maneuvering) load and horizontal (drag) load applied simultaneously to ensure the fitting will not deform or fail under the required reaction loads. The load will be applied using load cells attached to chain come-alongs to pull in the required directions.

Test 2 – Basket Lid

Test Plan and Report TR959.05 will be used to document the test plan and subsequent reporting on the test of the basket lid. The lid must be demonstrated to restrain the cargo load of 300 lbs at an ultimate negative maneuvering load factor of 1.5g. The load is simulated using bags of lead shot, 25 lbs each, stacked evenly over the surface of the lid, which is placed upside down and supported at the hinge and handle attachment points. The hinge and handle systems have already been demonstrated to support these loads, therefore only the carbon composite panel must be shown to be capable of transferring the load to the structure of the lid without permanent deformation at limit load or failure at ultimate load.

Review of Current ADs:

Airworthiness Directives applicable to the Bell 429 were reviewed, and none were found to be affected this project.

Approved Documentation Revisions:

See attached list of documents and disposition of changes.

In June 2013, Aero Design moved from Calgary, AB, to Powell River, BC. As such, the title blocks on all drawings are being revised to reflect the new address and company logo. Most of the existing drawings will require no other changes; drawings that do require minor changes will be indicated in the revision block of the drawing, but there are no major changes anticipated for the existing drawings.

Title: Quick Release Cargo Basket

Approval: STC

Manufacture: Mfd by Aero Design (amend Approved Product List)

Customer: Aero Design Ltd.

Type and Model: Bell 429

Definition Of Change:

Description:

Original configuration - rotorcraft S/N 57080 and previous

The cargo basket mounting provisions are installed on the cabin step provisions located on the outside of the fuselage below the main cabin door. The original step was installed with aluminum fittings on the outside of the fuselage, 3 per side, with bolts installed through integral-reinforced sections of the flanges of the fuselage frames.

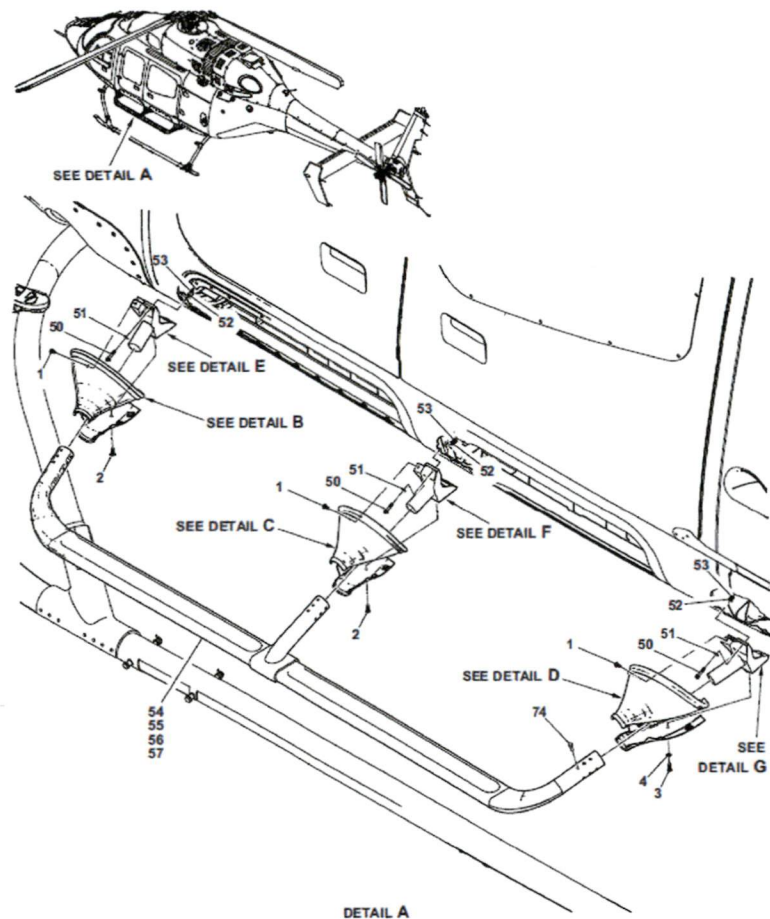


Figure 1 – Bell 429 Cabin Step Installation

The cargo basket mounting provisions use the forward and aft step positions on both sides, and installs fittings on the outside of the fuselage with bolts through the reinforced flanges of the frames, the same as the step. Support beams are then attached to the fittings with aluminum plates. The basket is installed on the support beams using the existing Aero Design quick release system, which consists of a seat track type fitting that slides into keyways and is retained with a spring loaded pin.

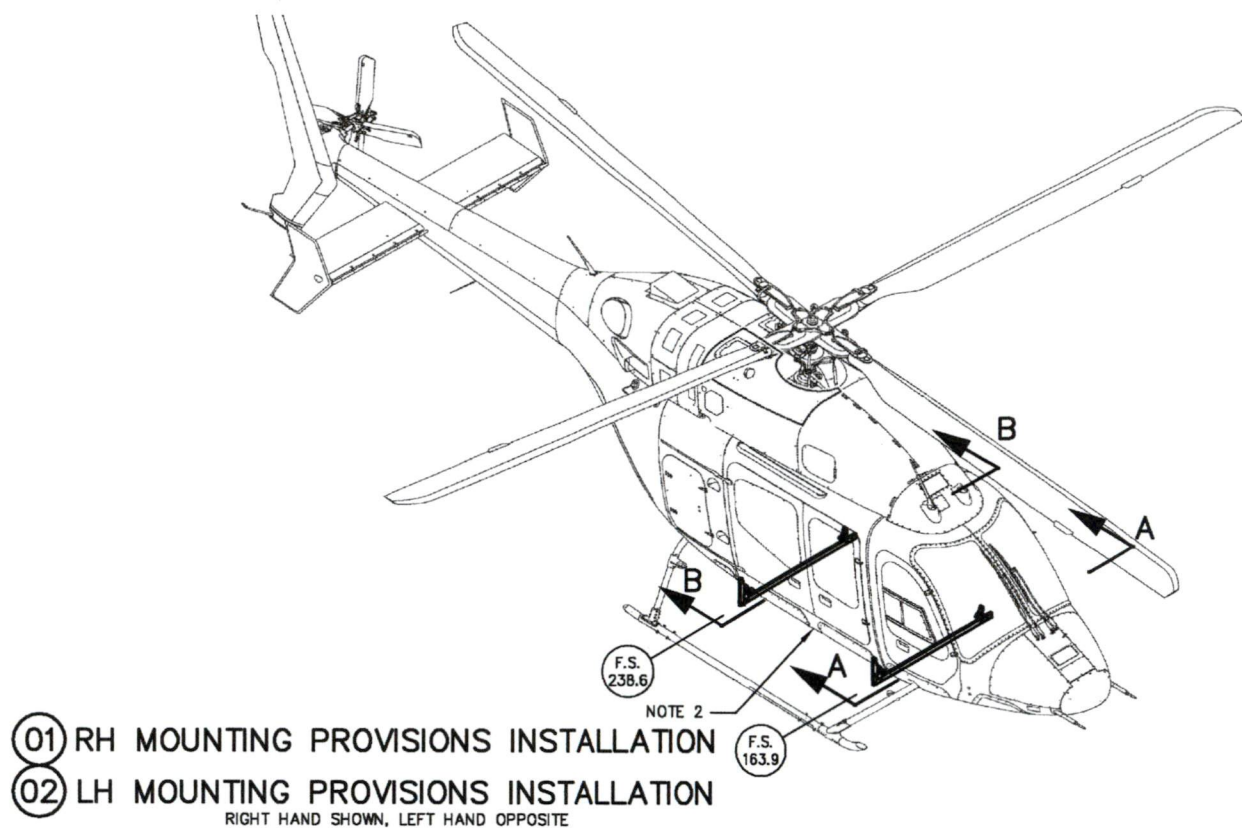


Figure 2 – Cargo Basket Mounting Provisions Installation

The centre of gravity of the cargo and basket are farther outboard than loads applied to the step, but because the basket is supported on both sides of the helicopter the bending moment and reaction loads applied to the fuselage are no higher than those applied by passengers using the step with the load factors specified by Bell.

The basket and mounting beams were load tested to demonstrate they are capable of supporting a cargo load of 300 lbs, at the critical load conditions. The attachment fittings were demonstrated to support the loads by analysis. Bell Helicopters provided a report to confirm the reaction loads due to the basket installation on the fuselage attachment points do not exceed the reaction loads due to the occupants of the step in the critical condition defined by Bell.

The mounting provisions and cargo basket were installed on an instrumented flight test helicopter and flight tested by Bell Helicopters at Mirabel, QC, with Transport Canada flight test pilot Michel Brulotte, to determine the flight limitations.

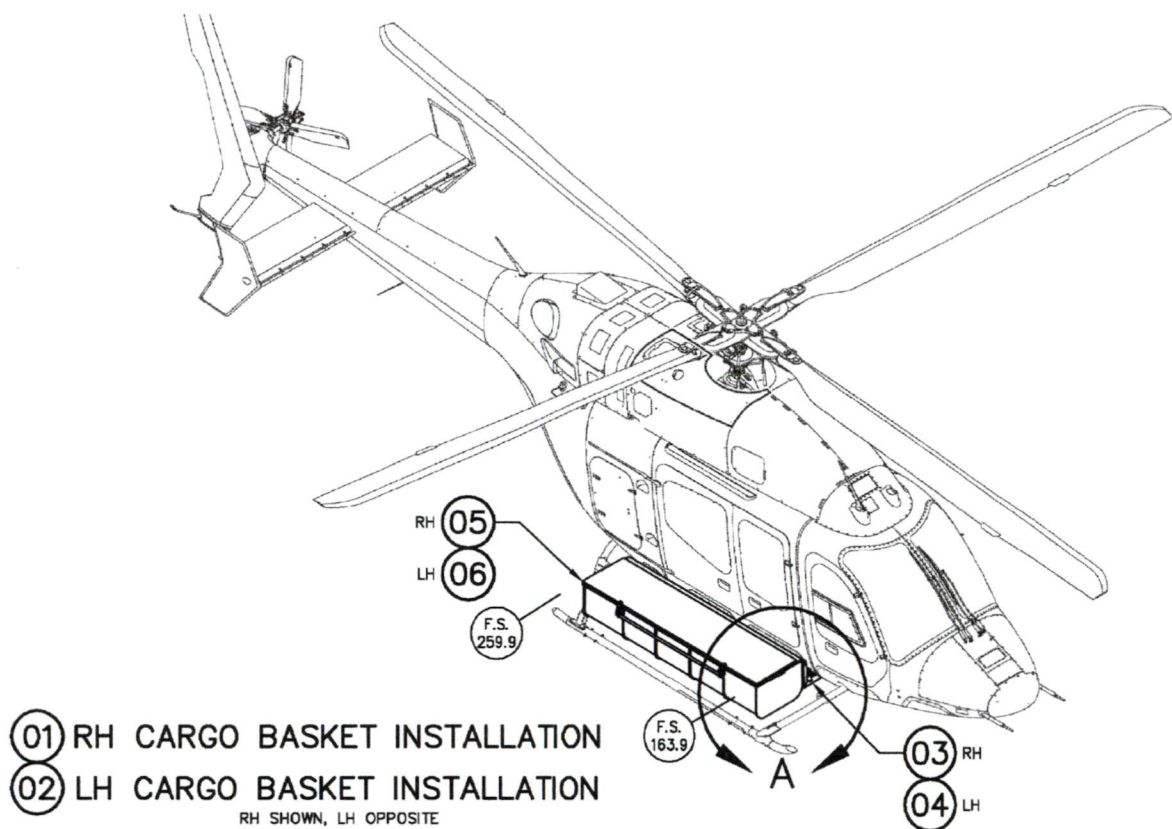


Figure 3 – Cargo Basket Installation

The basket assembly consists of a tubing structure lined with expanded steel mesh, as used on all Aero Design baskets. The structure is 4130 steel square tubing, 0.5 x 0.035 wall "hoops" and 0.75 x 0.035 wall "rims", with the aft attachment hoop using 1.0 x 0.065 tube, reference drawing 95911 for assembly details. The heavier tube is used to support the bending moment applied by the cargo through the basket frame; it is not required on the forward end because of a strut connecting the upper outboard corner and the lower inboard attachment. This is the same arrangement used on many other Aero Design baskets.

Early flight testing by Bell Helicopters determined that airflow through the basket caused vibration in the tailboom in some conditions at higher speeds, which were solved by making the lid and front end solid. As such, the lid assembly deviates from the typical Aero Design configuration, as it is covered with aluminum checker plate instead of expanded mesh. The forward end of the basket is covered with a flat aluminum sheet, riveted to the hoop and rim.

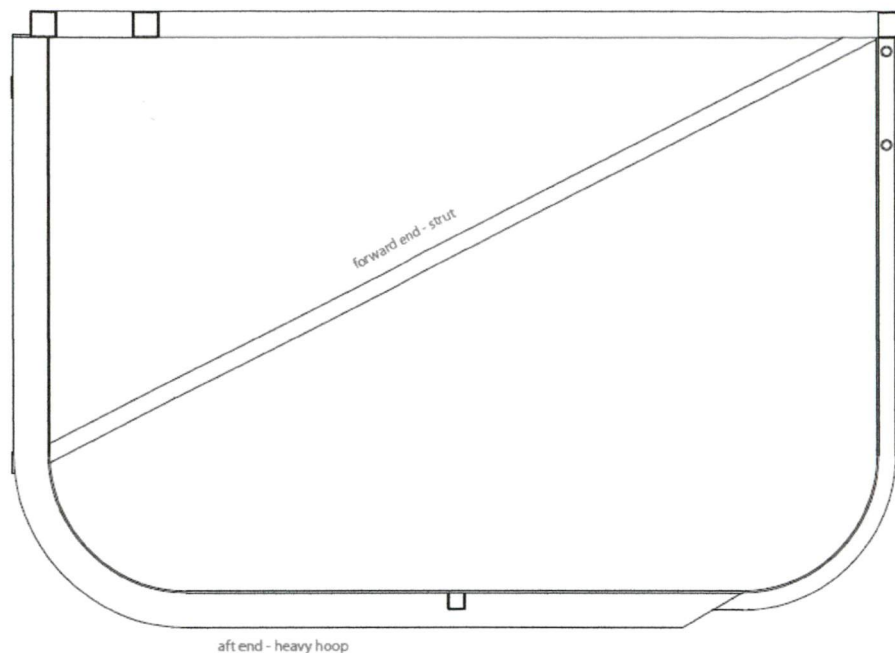


Figure 4 – Basket cross-section showing supports

The mounting beams are all stainless steel, primarily 1 x 2 x 0.125 wall rectangular tube. Keyways are machined into the outboard faces, and the latching mechanism is built into the aft beam. The keyways are arranged with a horizontal slot on the forward beam, which bottoms out as drag is applied to the basket, and vertical slot on the aft beam. The arrangement of horizontal and vertical allows for any minor twisting of the fuselage (usually caused by the landing gear on uneven surfaces or varied loading conditions in the helicopter) or a deviation in attachment spacing on the fuselage to be accommodated without twisting the basket to engage all of the keyways. The same arrangement is used on Aero Design AS350 and R44 baskets.

Cabin steps were added as an optional configuration shortly after the basket installation was approved. There is a fixed step that is installed on the opposite side to the basket, and a quick release step that is installed on the basket provisions when the basket is removed.

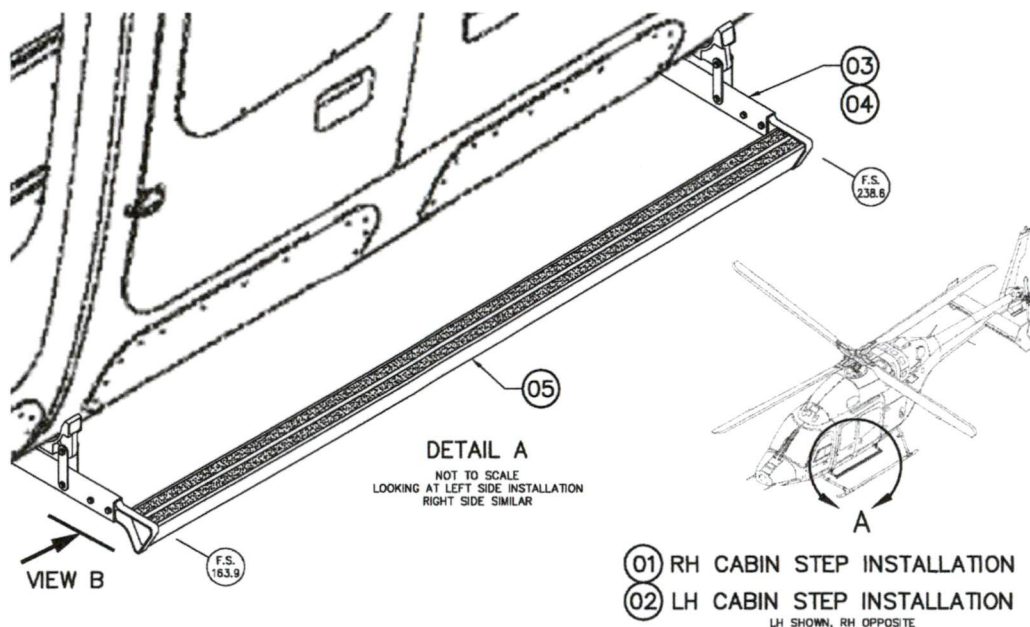


Figure 5 – Fixed Cabin Step Installation

The steps are located in the same position (laterally and vertically) as the original steps provided by Bell. These configurations were approved by Transport Canada and EASA as optional configurations on the approval document. When the approval was reviewed by the FAA, a determination was made that the steps cannot be optional because the original, type certified, aircraft is fitted with the steps and thus steps are required to provide equivalent access to/from the cabin. The FMS was revised to make the steps mandatory, but this is not reflected in the current TC or EASA STC documents. This is to be revised on this re-issue.

New configuration – rotorcraft S/N 57081 and subsequent

Starting at S/N 57081, Bell implemented a “cost and weight reduction program” on the 429. This resulted in a number of structural changes, including the attachment of the cabin step. Where the original configuration used fittings attached to the outside of the fuselage, the new configuration changed the step attachment to a socket arrangement attached to the web of the frames. This change shifts the forward and aft attachment points approximately 1.5” forward.

The altered configuration requires new attachment fittings that are inserted into the existing sockets for the steps. It is not feasible to maintain the original attachment positions. The new attachment position is inboard of the original configuration.

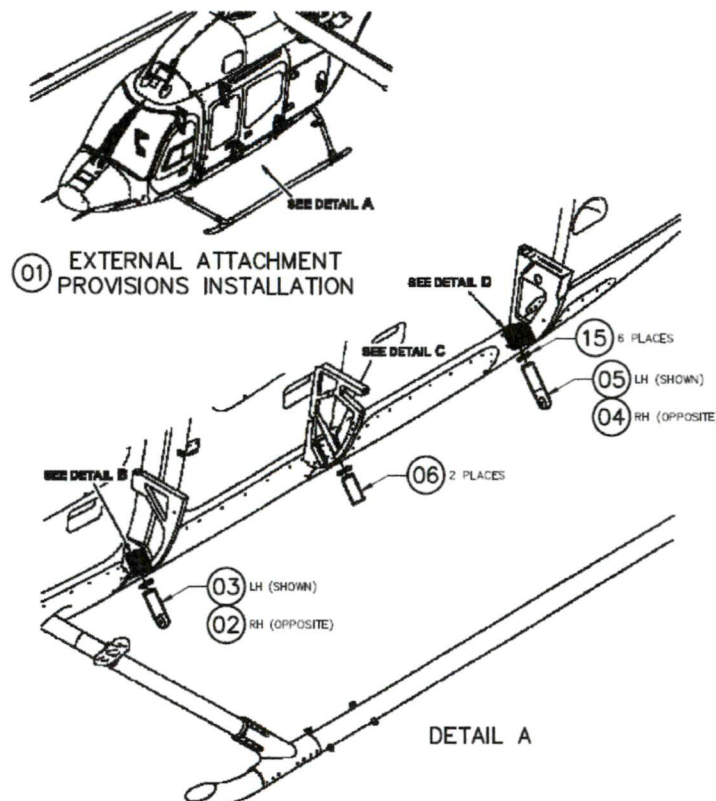


Figure 6 – New Attachment Provisions

The mounting beams must be slightly modified to shift the attachment points to accommodate the new position, and the reaction loads are increased due to being closer together. There are no other changes.

The basket assembly remains largely unchanged, however the shift of the attachments requires the forward end of the basket to be joggled to provide clearance from the forward cross tube during installation and removal of the basket. The original configuration was somewhat tight to the crosstube as the basket rotates forward as part of the installation/removal procedure, and Bell Product Support expressed some concern about the possibility of the basket touching the gear on installation and removal as the

manufacturing process for the cross tube allows for a small tolerance for scratches and damage. As such, there is an abrasion strip required as part of the original installation to protect the cross tube. Aero Design makes a 1.75" joggle on the aft end of the approved Bell 206L/407 cargo baskets, so there is already a procedure to make the required joggle. It would be very difficult to make the forward end out of sheet per the original configuration, due to the angles and radii of the joggle. Instead of flat aluminum sheet, a carbon/Kevlar composite panel formed to fit the joggle is used. The end covering is not structural, as the strut transfers loads from the outboard rim down to the lower attachment; it is only required to be close the end in.

The steps do not require any changes, but the weight and balance must be updated to reflect the shift forward, and as such the installation will get a new P/N.

Primary Changes to the Aeronautical Product:

Removal of cabin steps on both sides; Installation of attachment fittings, installation of mounting beams, installation of cargo basket

Secondary Changes to the Aeronautical Product (Required as consequence of primary changes):

None

Other Relevant Modifications to the Aeronautical Product (Which impact on this change):

None

CHANGED PRODUCT RULE (CPR) DECISION RECORD

NAPA No.:

Step 1: Identify the proposed change to the aeronautical product.

(Section 4.1 of AC 500-016)

The changes are detailed in the listed document(s):

Project Summary PS959-1 (above)

Note: A G-1 Issue Paper may be required to track/document the decisions at Step 2 and Steps 5 through 8, and to detail the concluded certification basis.

Step 2: Is the change substantial?

(Section 4.2 of AC 500-016)

☐ YesA new type certificate is required. CPR Decision Process is **Closed**.☒ No

Proceed to Step 3

Step 3: Will the latest standards be used?

(Section 4.3 of AC 500-016)

☐ YesCertification basis to use latest standards. **Proceed to Step 8.**☒ No

Proceed to Step 4.

Step 4: Group changes into related and unrelated groupings.

(Section 4.4 of AC 500-016)

You may need to define the project in the format of the AC's example for Step 4.

Note: For multiple groupings, continuation of this process should be split to separate decision records.

Step 5: Is the proposed change significant?

(Section 5.0 of AC 500-016)

☐ YesProceed to **Decision**.☒ NoCompliance may be shown to earlier standards. Certification basis to be defined and documented as indicated (below). **Proceed to Step 8.**

Decision: Will the latest standards be used?

☐ YesCertification basis to use latest standards. **Proceed to Step 8.**☐ No

Proceed to Step 6, addressing each area separately (see below).

Identification of Affected Areas:

The area(s) affected by the proposed change have been detailed in Certification Plan document number(s):

Step 6: Is this area affected by the proposed change? (Ask for each area)

(Section 6.1 of AC 500-016)

☐ Yes

Proceed to Step 7.

☐ No

Compliance with the latest standards is not required. Compliance may be continued to be shown with the existing certification basis.

Step 7: Do the latest standards contribute materially to the level of safety and are they practical?

(Section 6.2 of AC 500-016)

☐ Yes

Certification basis to be established using latest standards.

☐ No

Compliance with the latest standards is not required. Compliance may be shown to earlier standards. Certification Basis defined or documented as indicated in below.

Note: Several standards may apply to each area and the assessment may differ from standard to standard. Indicate Yes if compliance with any latest standard(s) will be required. Indicate No only if earlier standards are to be applied.

☐ Continuation Sheet(s) Attached**Note:**

A delegate may develop a proposal for the Yes/No decision of Step 7. TCCA will make the final determination.

Step 8: Is the proposed Basis of Certification Adequate?

(Section 8.0 of AC 500-016)

☒ Yes

Stop! CPR Decision Process is **Closed**.
Determination of Certification Basis is Complete!

☐ No

Basis of certification may require later airworthiness standards or Special Conditions – Consult TCCA.

Certification Basis

The certification basis is as follows or as detailed in the listed document(s):

Bell 429, TCDS H-107:

Airworthiness Manual Chapter 527, including at Change 527-6, including Appendix B for IFR and Appendix C for Category A.

Appendix C specifies certain sections of AWM Chapter 529. For these specified sections, AWM Chapter 529 at Change 529-6 is applicable.

Under the delegated authority, I have examined the change in type design listed above according to established procedures and hereby determine, to the best of my knowledge and belief, that it is. (check one)

- ☐ substantial, pursuant to section 521.153 of the CARs
- ☐ significant, pursuant to subsection 521.158(3) of the CARs
- ☐ not significant, pursuant to subsection 521.158(3) of the CARs

James Tinson, DAR304

Date

Number	Title	Revision (current approved)	Revision (new)	Description of change
SH12-58	Transport Canada STC	(original)	2	Add new configuration, new address
10043360	EASA STC	1	2	Add new configuration, new address
SR03317NY	FAA STC	24/09/13	(amend)	Add new configuration, new address
DCL959-1	Document Control List - Basket Installation	1	2	Add new configuration, new address
95901	Cargo Basket Installation - S/N 57080 and prev.	0	1	Title block updated for new address
95905	Cargo Basket Installation - S/N 57081 and sub.	--	0	New drawing
FMS959.90	Flight Manual Supplement - Cargo Basket	1	2	Add new configuration, new address
ICA959.91	Instructions for Continued Airworthiness - Cargo Basket	0	1	Add new configuration, new address
DCL959-2	Document Control List - Mounting Provisions Installation	1	2	Add new configuration, new address
95902	Mounting Provisions Installation - S/N 57080 and prev.	0	1	Title block updated for new address
95906	Mounting Provisions Installation - S/N 57081 and sub.	--	0	New drawing
95907	External Attachment Provisions Installation - S/N 57081 and sub.	--	0	New drawing
DCL959-11	Document Control List - Basket Assembly - S/N 57080 and prev.	0	1	Changes below, new address
95910	Cargo Basket Assembly	0	1	Title block updated for new address
95911	Basket Fabrication	0	1	Title block updated for new address
95912	Lid Fabrication	0	1	Title block updated for new address
95915	Basket Components - Forward Sheet	0	1	Title block updated for new address
95916	Basket Components - Filler Sheets	0	1	Title block updated for new address
95917	Basket Components - Lid Checker Plate	0	1	Title block updated for new address
95925	Basket Components - Forward Attachment Hoop	0	1	Title block updated for new address
95926	Basket Components - Aft Attachment Hoop	0	1	Title block updated for new address
95927	Basket Components - Placard	0	1	Add new configuration, new address
94520	Basket Components - Hoop	0	1	Title block updated for new address
49215	Basket Components - Spacer	0	1	Title block updated for new address
49216	Basket Components - Spacer	0	1	Title block updated for new address
84255	Handle Assembly	1	2	Title block updated for new address
84261	Handle Bar Assembly	1	2	Title block updated for new address
84262	Handle Bracket Assembly	1	2	Title block updated for new address
84265	Handle Lever	1	2	Title block updated for new address
84267	Handle Bracket	0	1	Title block updated for new address
84272	Bushing	0	1	Title block updated for new address
36273	Lid Bracket	1	2	Title block updated for new address
36274	Bushing	2	3	Title block updated for new address
36275	Bushing	3	4	Title block updated for new address
36277	Handle Bar	0	1	Title block updated for new address
36278	Spring	2	3	Title block updated for new address
36280	Brace	2	3	Title block updated for new address
ER959.01	Engineering Report - Basket Installation	0	0	No change

DCL959-11 (Continued)

ER959.02 Engineering Report - Load Test	0	0 No change
ER842.01 Engineering Report - Handle Assembly	0	0 No change
Flight Test Report – Transport Canada	--	-- No change
DCL959-12 Document Control List - Mounting Provisions Fabrication - S/N 57080 and prev.	0	0 Changes below, new address
95920 Forward Fitting Fabrication	0	1 Title block updated for new address
95921 Aft Fitting Fabrication	0	1 Title block updated for new address
95922 Plates Fabrication	0	1 Title block updated for new address
95923 Bushing Fabrication	0	1 Title block updated for new address
95930 Forward Beam Fabrication	0	1 Title block updated for new address
95931 Aft Beam Fabrication	0	1 Title block updated for new address
DCL959-15 Document Control List - Basket Assembly - S/N 57081 and sub.	--	0 New document
95950 Cargo Basket Assembly	--	1 New drawing
95951 Basket Fabrication	--	1 New drawing
95952 Lid Fabrication	--	1 New drawing
95965 Basket Components - Forward Sheet	--	1 New drawing
95966 Basket Components - Filler Sheet	--	1 New drawing
95967 Basket Components - Lid Sheet	--	1 New drawing
95965 Basket Components - Forward Attachment Hoop	--	1 New drawing
95926 Basket Components - Aft Attachment Hoop	--	1 (above, DCL959-11)
95927 Basket Components - Placard	--	1 (above, DCL959-11)
94520 Basket Components - Hoop	--	1 (above, DCL959-11)
49215 Basket Components - Spacer	--	1 (above, DCL959-11)
49216 Basket Components - Spacer	--	1 (above, DCL959-11)
84255 Handle Assembly	--	2 (above, DCL959-11)
84261 Handle Bar Assembly	--	2 (above, DCL959-11)
84262 Handle Bracket Assembly	--	2 (above, DCL959-11)
84265 Handle Lever	--	2 (above, DCL959-11)
84267 Handle Bracket	--	1 (above, DCL959-11)
84272 Bushing	--	1 (above, DCL959-11)
36273 Lid Bracket	--	2 (above, DCL959-11)
36274 Bushing	--	3 (above, DCL959-11)
36275 Bushing	--	4 (above, DCL959-11)
36277 Handle Bar	--	1 (above, DCL959-11)
36278 Spring	--	3 (above, DCL959-11)
36280 Brace	--	3 (above, DCL959-11)
ER959.01 Engineering Report - Basket Installation	--	0 (above, DCL959-11)
ER959.02 Engineering Report - Load Test	--	0 (above, DCL959-11)
ER842.01 Engineering Report - Handle Assembly	--	0 (above, DCL959-11)
Flight Test Report – Transport Canada	--	-- (above, DCL959-11)
ER959.03 Engineering Report - S/N 57081 and sub. Configuration	--	0 New document

DCL959-16 Document Control List - Mounting Provisions Fabrication

95940 Fittings Fabrication
95942 Plates Fabrication
95923 Bushing Fabrication
95932 Forward Beam Fabrication
95933 Aft Beam Fabrication

-- 0 New document
-- 0 New drawing
-- 0 New drawing
-- 1 (above, DCL959-12)
-- 0 New drawing
-- 0 New drawing

DCL969-1 Document Control List - Cabin Steps Installation

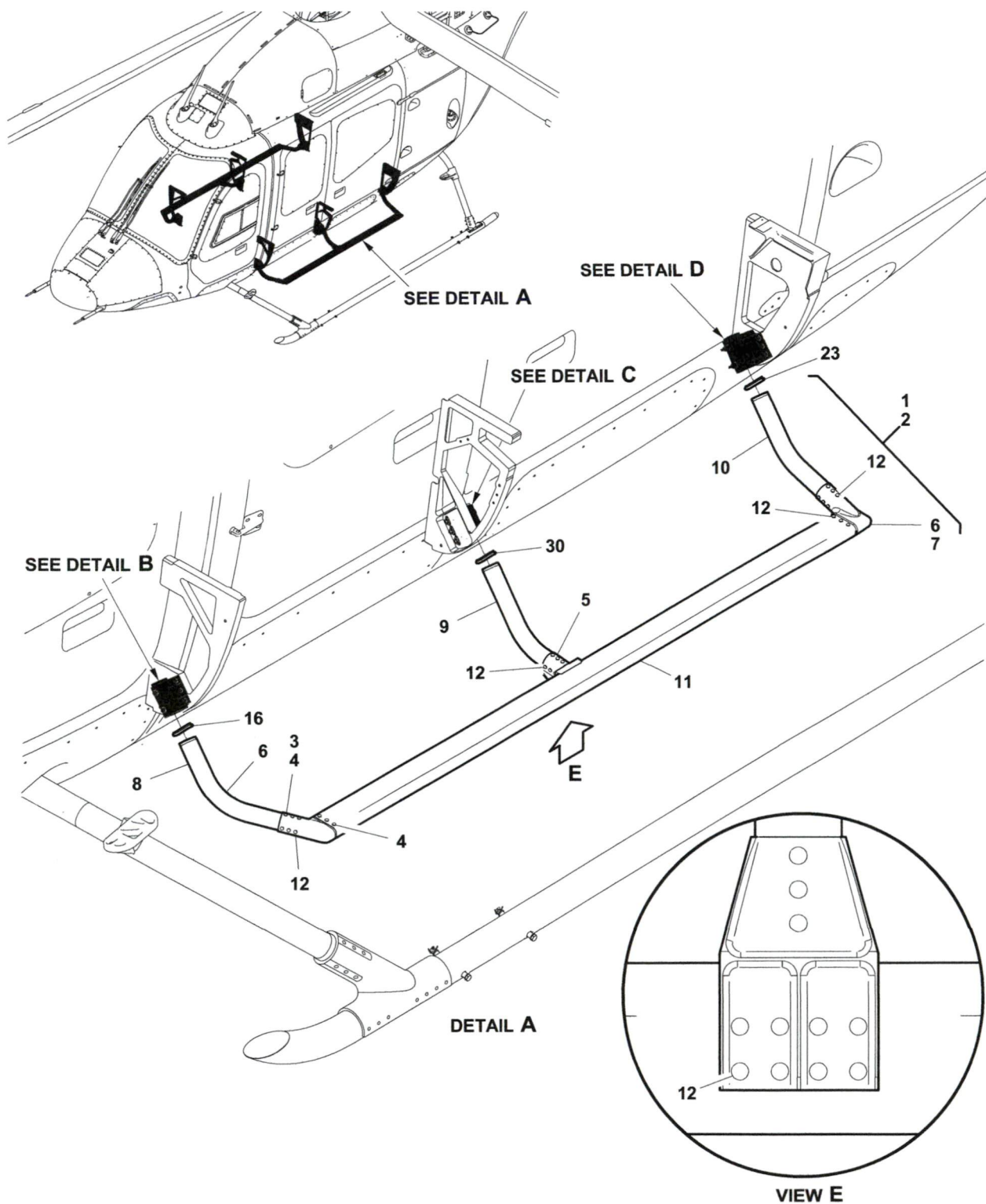
96901 Fixed Cabin Step Installation - S/N 57080 and prev.
96902 Quick Release Cabin Step Installation - S/N 57080 and prev.
96905 Fixed Cabin Step Installation - S/N 57081 and sub.
96906 Quick Release Cabin Step Installation - S/N 57081 and sub.
FMS969.90 Flight Manual Supplement - Steps
ICA969.91 Instructions for Continued Airworthiness - Steps

1 2 Add new configuration, new address
0 1 Title block updated for new address
0 1 Title block updated for new address
-- 0 New drawing
-- 0 New drawing
1 2 Add new configuration, new address
0 1 Add new configuration, new address

DCL969-11 Document Control List - Cabin Steps Fabrication

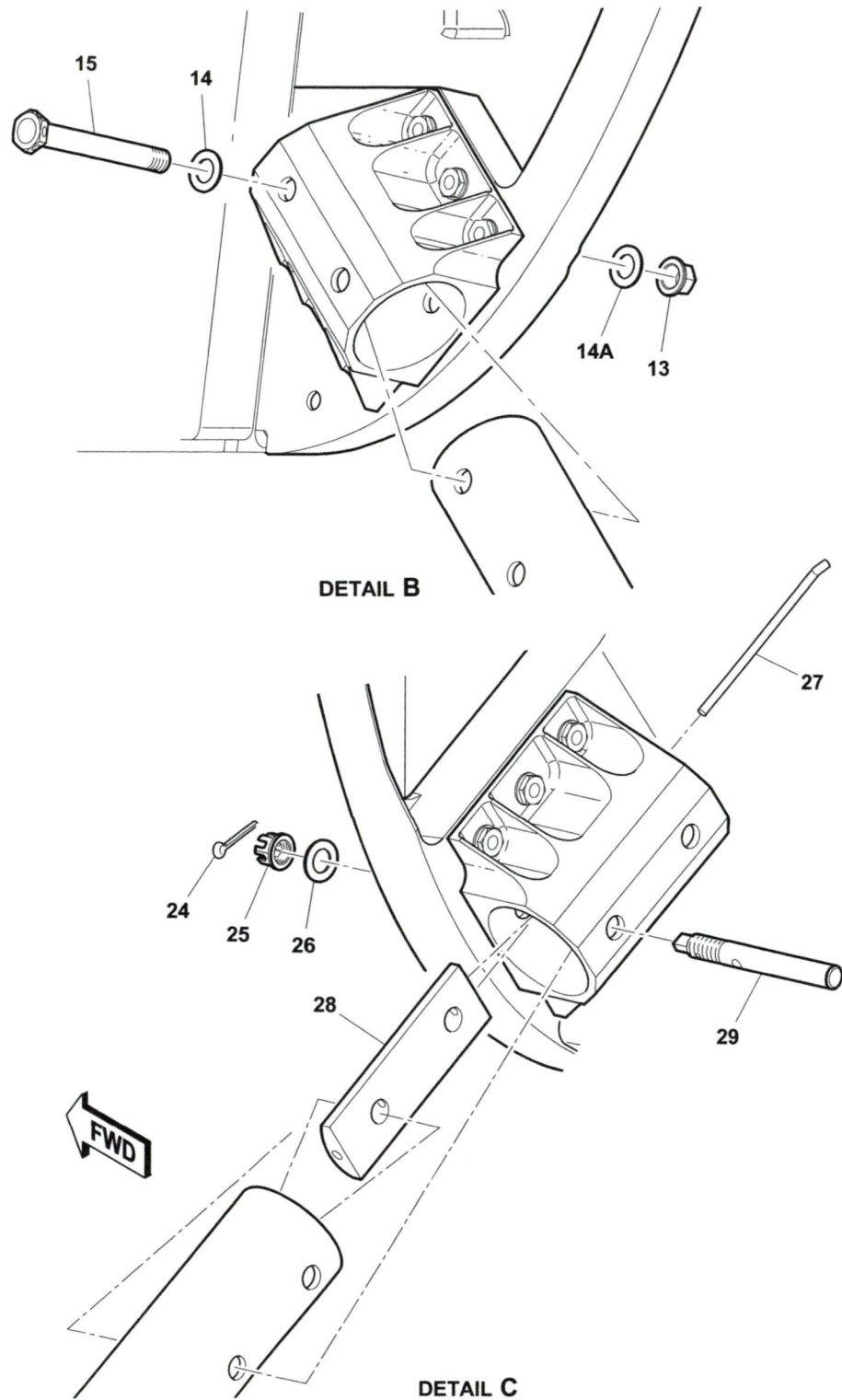
96910 Fixed Step Assembly
96911 Quick Release Step Assembly
96920 Fixed Step Brackets
96921 Quick Release Step Brackets
80010 Quick Release Step Assembly (Alternate)
80020 Quick Release Step Brackets
ER969.01 Engineering Report

0 1 Changes below, new address
0 1 Title block updated for new address
0 1 Title block updated for new address
0 1 Title block updated for new address
0 1 Title block updated for new address
1 -- Removed - not required as alternate
0 -- Removed - not required as alternate
0 0 no change



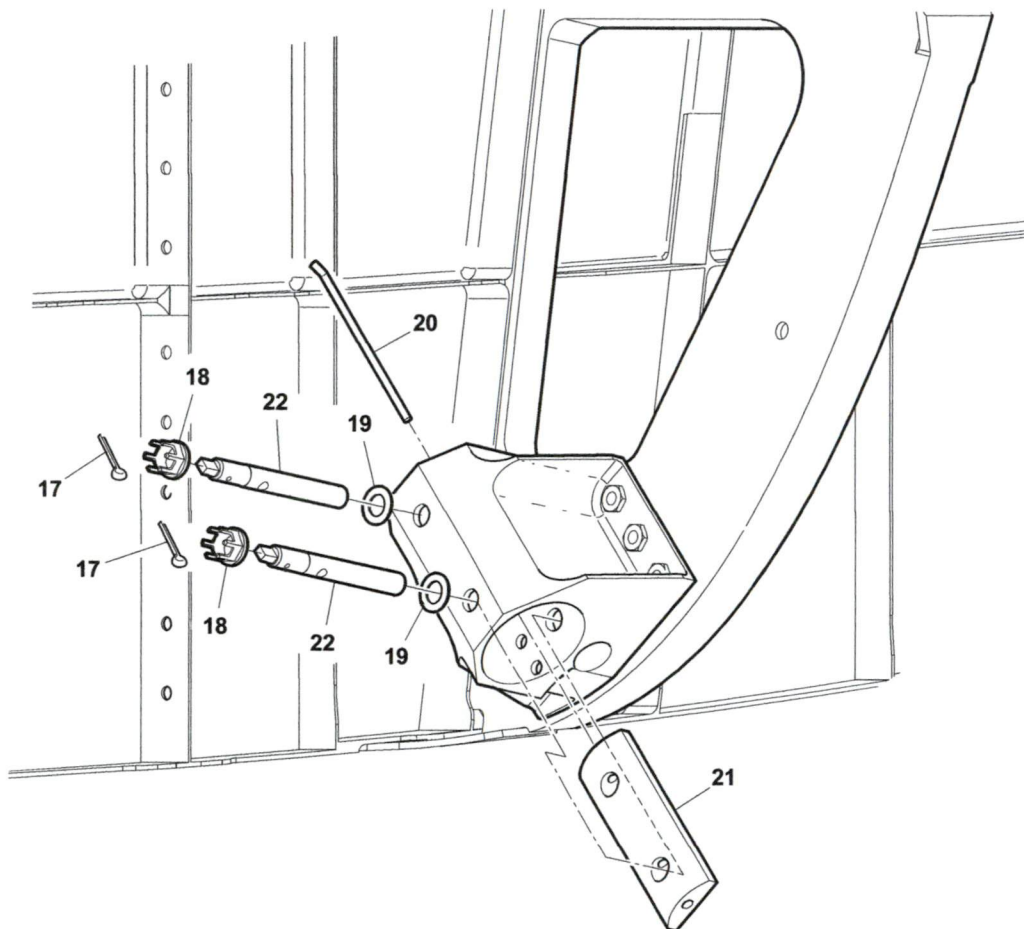
429_IPB_32_0008a

Figure 32-5B. Passenger Step, Full Step Installation (S/N 57081 and Subsequent) (Sheet 1 of 3)



429_IPB_32_0008b_c01

Figure 32-5B. Passenger Step, Full Step Installation (S/N 57081 and Subsequent) (Sheet 2 of 3)

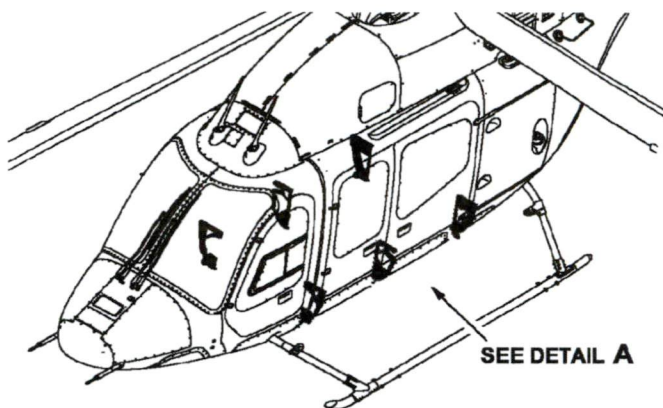


DETAIL D

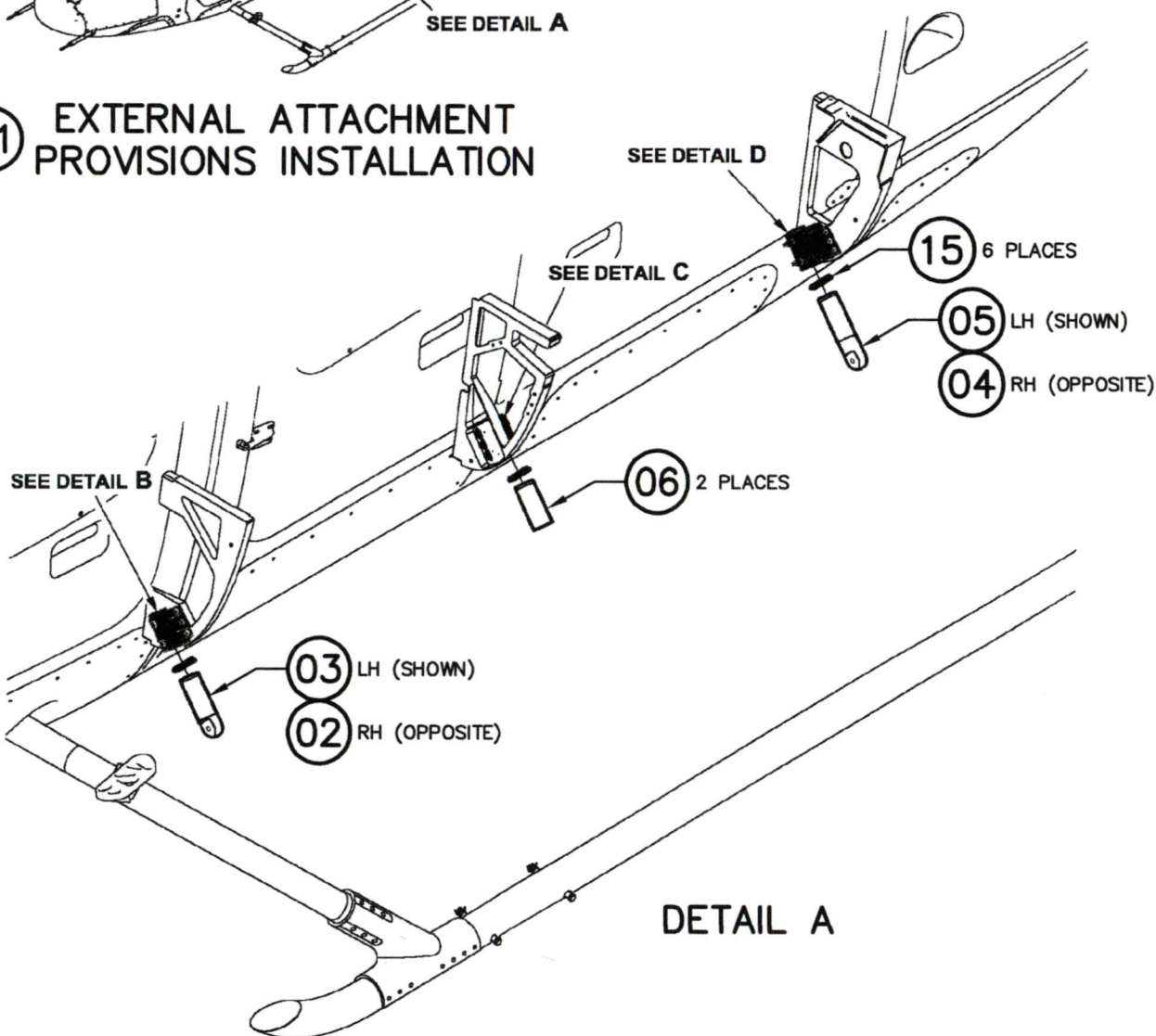
429_IPB_32_0008c_c01

Figure 32-5B. Passenger Step, Full Step Installation (S/N 57081 and Subsequent) (Sheet 3 of 3)

(1)	(2)	(3)	(4)	(5)	(6)
INDEX NUMBER	PART NUMBER	ITEM NAME	UNIT PER ASSY	A V A I L	U O C
		Figure 32-5B. Passenger Step, Full Step Installation (S/N 57081 and Subsequent)			
	429-706-074-105	FULL STEP INSTL	1	P	
1	429-030-136-101	. FULL PASSENGER STEP ASSY, LH	1	P	
2	429-030-136-102	. FULL PASSENGER STEP ASSY, RH	1	P	
3	429-030-109-101	. . FITTING TUBE FWD, LH	1		
4	429-030-109-102	. . FITTING TUBE FWD, RH	1		
5	429-030-109-103	. . FITTING TUBE MID	1		
6	429-030-109-105	. . FITTING TUBE AFT, LH	1		
7	429-030-109-106	. . FITTING TUBE AFT, RH	1		
8	429-030-117-103	. . TUBE, PASSENGER STEP	1		
9	429-030-117-105	. . TUBE, PASSENGER STEP	1		
10	429-030-117-107	. . TUBE, PASSENGER STEP	1		
11	429-030-117-109	. . TUBE, PASSENGER STEP	1		
12	110-223-05	. . FASTENER, BLIND	54	NP	
13	MS21042L5	. NUT, SELF-LOCKING	2	SP	
14	NAS1149D0532J	. WASHER, FLAT	2	P	
14A	NAS1149D0563J	. WASHER, FLAT	2	SP	
15	NAS6605L32	. BOLT	6	P	
16	120-205-2	. SEAL	2	SP	
17	MS24665-132	. PIN, COTTER	4	SP	
18	MS14144L5	. NUT, SELF-LOCKING	4	SP	
19	NAS1149D0532J	. WASHER, FLAT	8	P	
20	429-706-074-119	. SHEAR PIN	2	P	
21	429-706-074-117	. RADIUS BLOCK	2	P	
22	429-706-074-115	. STUD	4	P	
23	120-205-2	. SEAL	2	SP	
24	MS24665-132	. PIN, COTTER	4	SP	
25	MS14144L5	. NUT, SELF-LOCKING	4	SP	
26	NAS1149D0532J	. WASHER, FLAT	4	P	
27	429-706-074-119	. SHEAR PIN	2	P	
28	429-706-074-117	. RADIUS BLOCK	2	P	
29	429-706-074-115	. STUD	4	P	
30	120-205-2	. SEAL	2	SP	
		AVAIL CODE DEFINITION			
		P Procurable			
		NP Non Procurable			
		SP Normal Stock/Procurement			
		Please see Chapter 1 for additional information on availability codes as well as general use of the Illustrated Parts Breakdown Manual.			



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DECIMALS		ANGLES
X.XXX	±0.010	±1/2°
X.XX	±0.03	
X.X	±0.1	

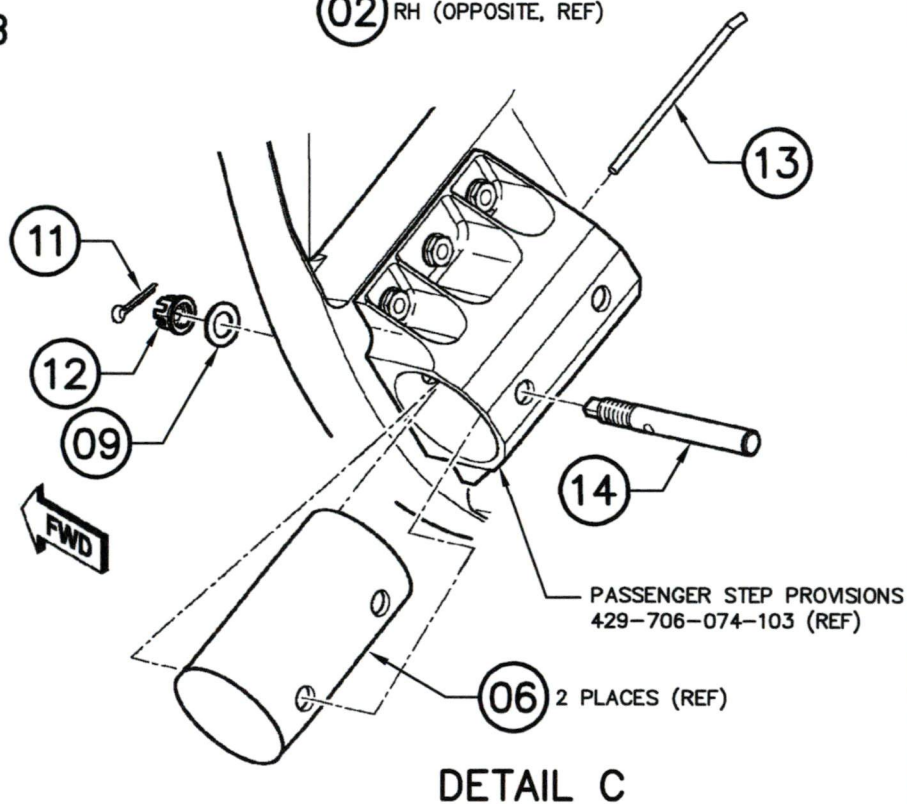
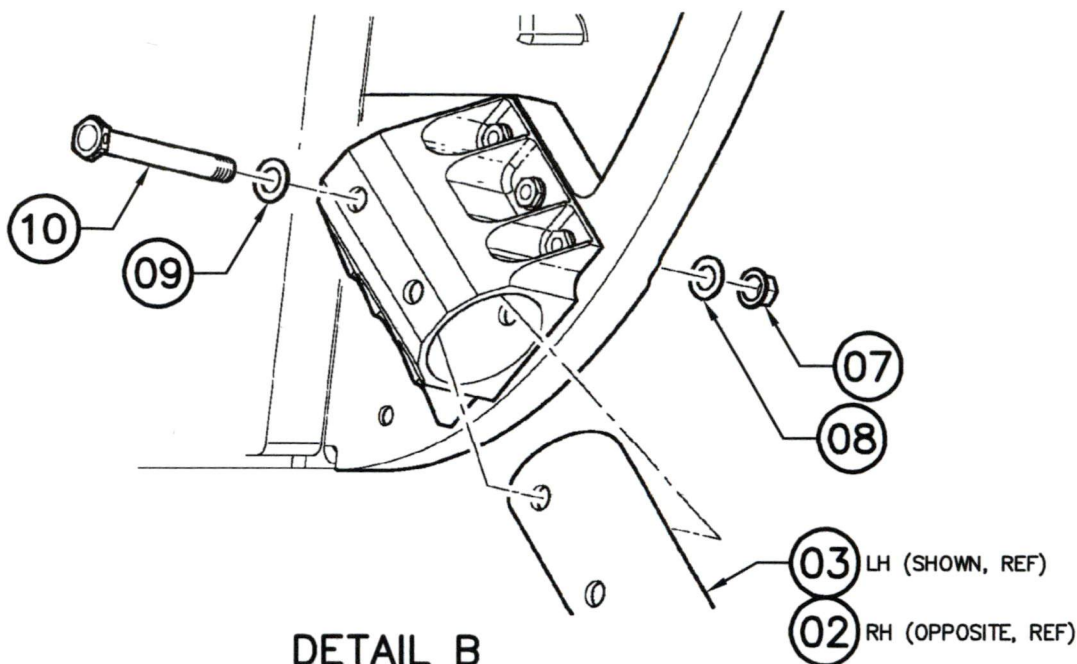


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**BELL 429
QUICK RELEASE CARGO BASKET
EXTERNAL ATTACHMENT PROVISIONS INSTALLATION**

SCALE 1 : 1	DWG. SIZE	DWG. NO.	REV.
SHEET 1 OF 4	A4	95907	0



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X.XX ± 0.03	
X.X ± 0.1	

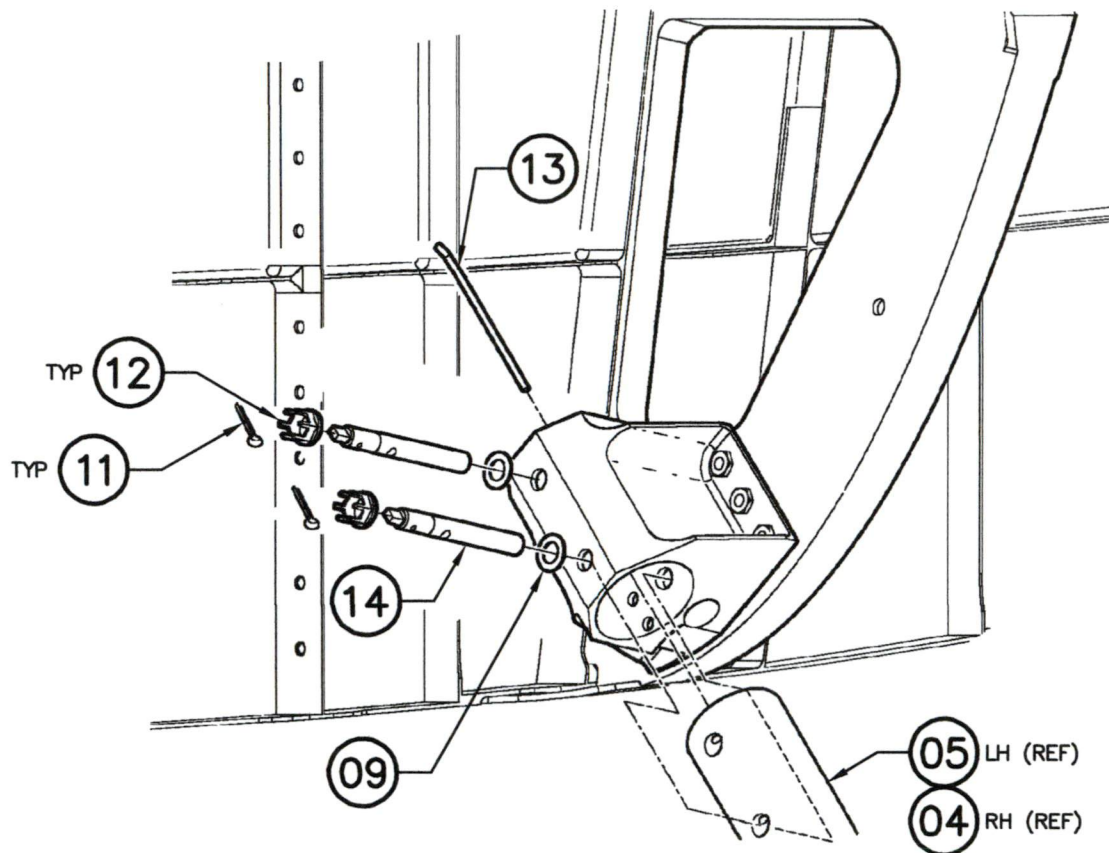


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SHEET 2 OF 4	A4	95907	0



DETAIL D

4	120-205-2	15	SEAL	BELL HELICOPTER		
8	429-706-704-115	14	STUD	BELL HELICOPTER		
4	429-706-074-119	13	SHEAR PIN	BELL HELICOPTER		
8	MS14144L5	12	NUT			
8	MS24665-132	11	COTTER PIN			
4	NAS6605L32	10	BOLT			
12	NAS1149D0532J	09	WASHER			
4	NAS1149D0563J	08	WASHER			
4	MS21042L5	07	NUT			
2	95940-05	06	CENTRE PLUG			
1	95940-04	05	AFT LH LUG			
1	95940-03	04	AFT RH LUG			
1	95940-02	03	FORWARD LH LUG			
1	95940-01	02	FORWARD RH LUG			
1	95907-01	01	EXTERNAL ATTACHMENT PROVISIONS INSTALLATION			
QTY	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE

LIST OF MATERIALS

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	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON:					BELL 429 QUICK RELEASE CARGO BASKET EXTERNAL ATTACHMENT PROVISIONS INSTALLATION	
	DECIMALS X.XXX ±0.010 X.XX ±0.03 X.X ±0.1		ANGLES ±1/2°				
	SCALE 1 : 1 SHEET 3 OF 4		DWG. SIZE A4				
				DWG. NO. 95907		REV. 0	

REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		

NOTES

1. THIS INSTALLATION IS APPLICABLE TO BELL 429 S/N 57081 AND SUBSEQUENT.
FOR ATTACHMENT PROVISIONS INSTALLATION ON S/N 57080 AND PREVIOUS, REFER TO DRAWING 95902.
2. PASSENGER STEP PROVISIONS 429-706-074-103 (MID) AND 429-706-074-107 (FORWARD AND AFT)
MUST BE INSTALLED PRIOR TO THIS INSTALLATION.
3. CABIN STEP MUST BE REMOVED FROM BOTH SIDES PRIOR TO THIS INSTALLATION. REFER TO MAINTENANCE
MANUAL BHT-429-MM-1, SECTION 32-57. RETAIN HARDWARE FOR USE WITH THIS INSTALLATION AS APPLICABLE.
4. TORQUE 5/16" FASTENERS TO 60-85 INCH-POUNDS (6.8-9.6 Nm).
5. REFER TO INSTRUCTIONS FOR CONTINUED AIRWORTHINESS ICA959.91 FOR DETAILED INSTALLATION INSTRUCTIONS.

WEIGHT AND BALANCE – METRIC

ITEM	DESCRIPTION	WEIGHT (kg)	LONGITUDINAL		LATERAL	
			ARM (mm)	MOMENT (mm-kg)	ARM (mm)	MOMENT (mm-kg)
06	CENTRE PLUG (RH/LH)	0.27	5113.0	1381	0.0	0.0
04/05	AFT LUG (RH/LH)	0.59	6024.9	3555	0.0	0.0
02/03	FORWARD LUG (RH/LH)	0.36	4125.0	1485	0.0	0.0
01	EXTERNAL ATTACHMENT PROVISIONS INSTALLATION (TOTAL)	1.22	5263.1	6421	0.0	0.0

WEIGHT AND BALANCE – STANDARD

ITEM	DESCRIPTION	WEIGHT (LB)	LONGITUDINAL		LATERAL	
			ARM (IN)	MOMENT (LB-IN)	ARM (IN)	MOMENT (LB-IN)
06	CENTRE PLUG (RH/LH)	0.6	201.3	120.8	0.0	0.0
04/05	AFT LUG (RH/LH)	1.3	237.2	308.4	0.0	0.0
02/03	FORWARD LUG (RH/LH)	0.8	162.4	129.9	0.0	0.0
01	EXTERNAL ATTACHMENT PROVISIONS INSTALLATION (TOTAL)	2.7	207.1	559.1	0.0	0.0

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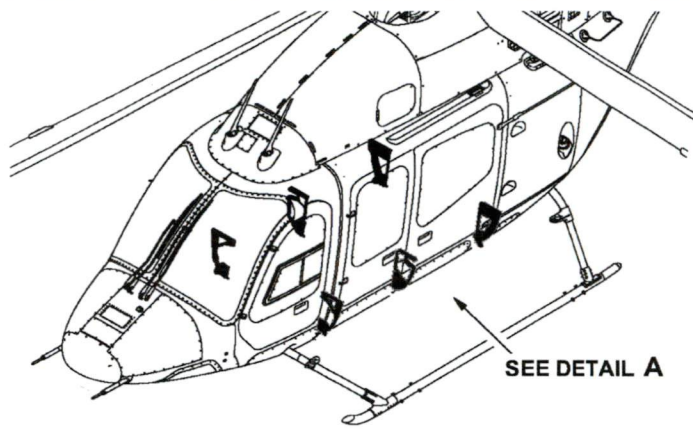


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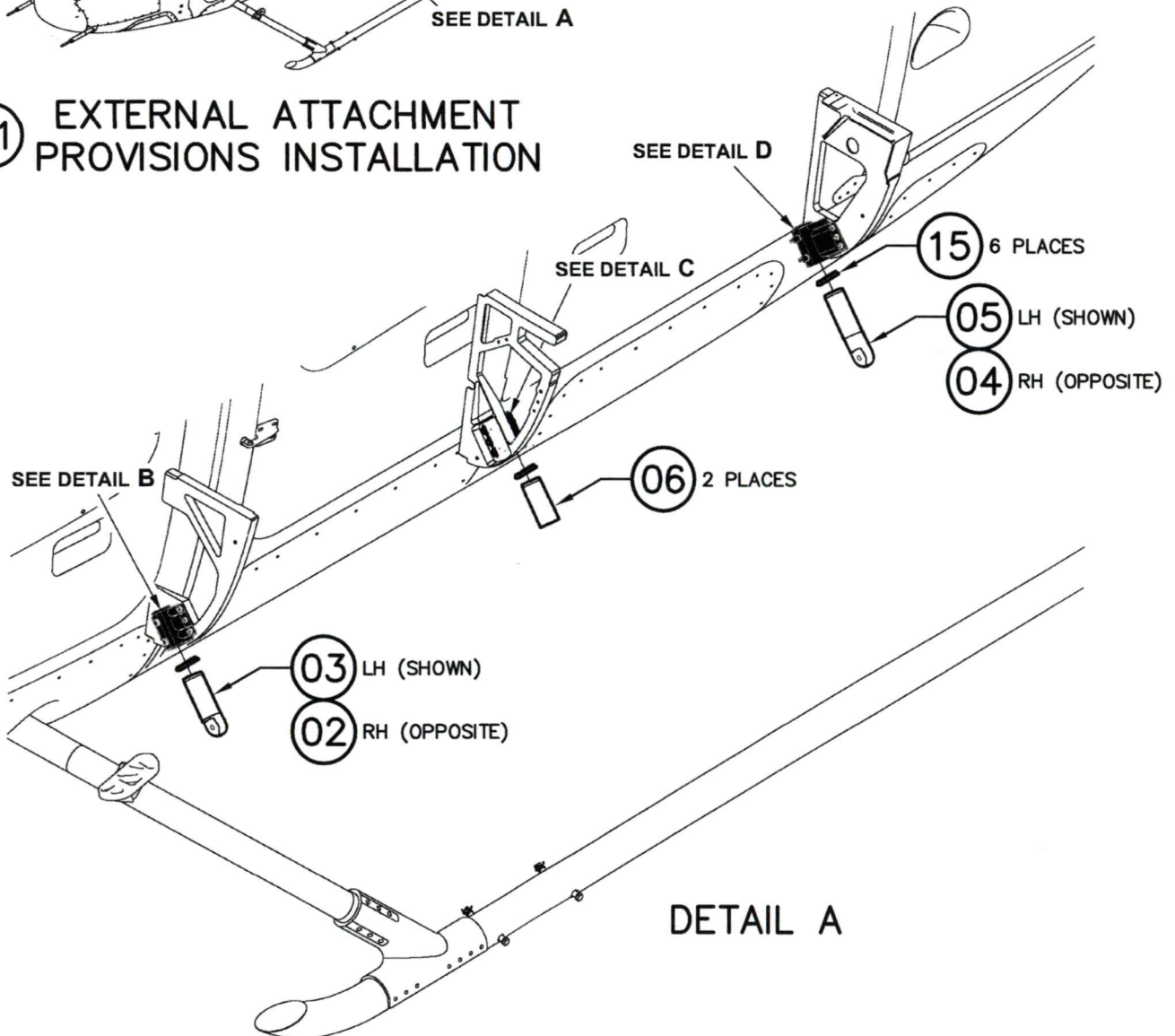
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SHEET 4 OF 4	A4	95907	0	



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DECIMALS	ANGLES
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X.X ±0.1	

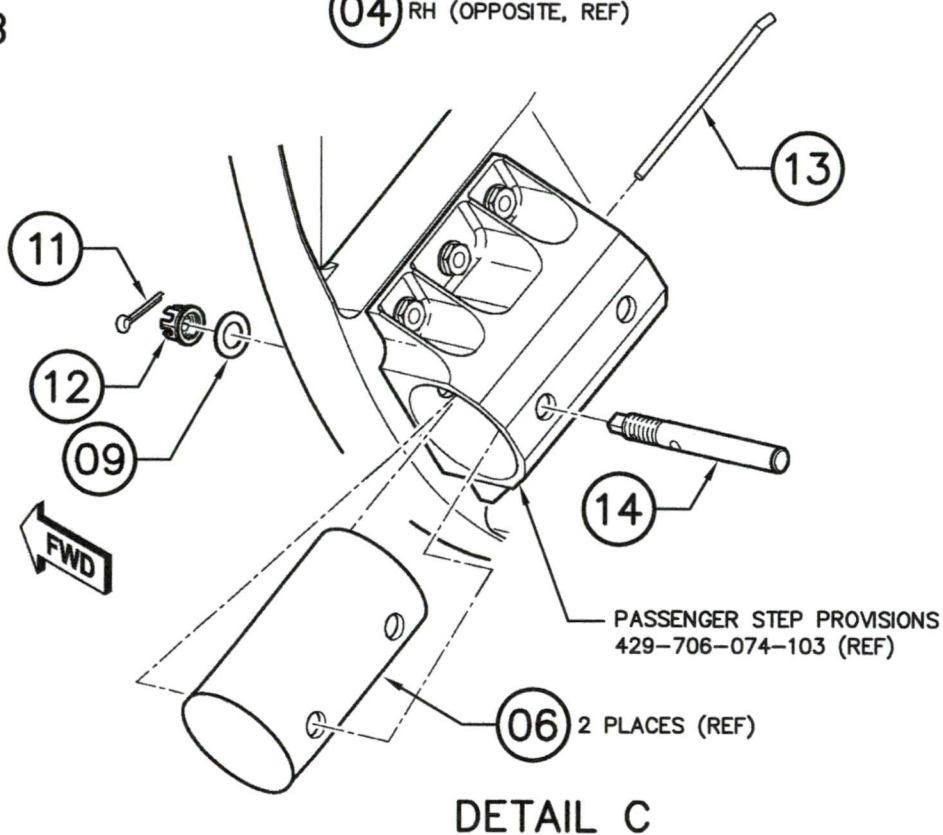
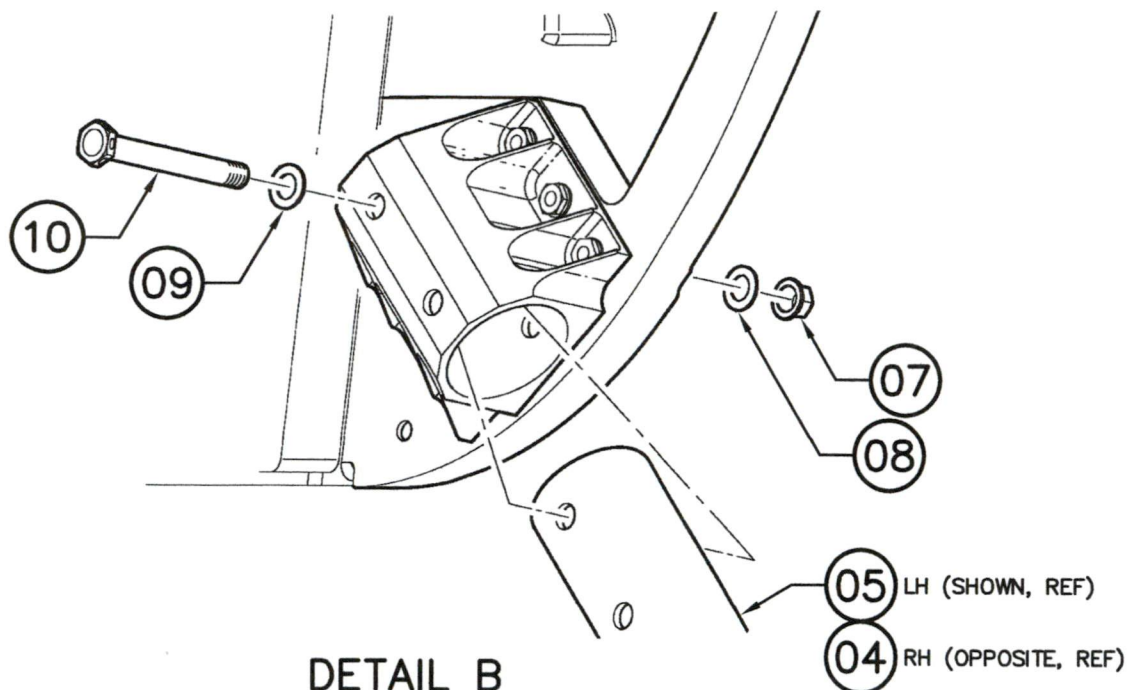


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**BELL 429
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SCALE 1 : 1	DWG. SIZE	DWG. NO.	REV.
SHEET 1 OF 4	A4	95907	0



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APPROVALS	DATE
DRAWN: JEFF CLARKE	25 JAN 2014
CHECKED: JASON REKVE	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES.
TOLERANCES ON:

DECIMALS	ANGLES
X.XXX ± 0.010	$\pm 1/2^\circ$
X.XX ± 0.03	
X.X ± 0.1	

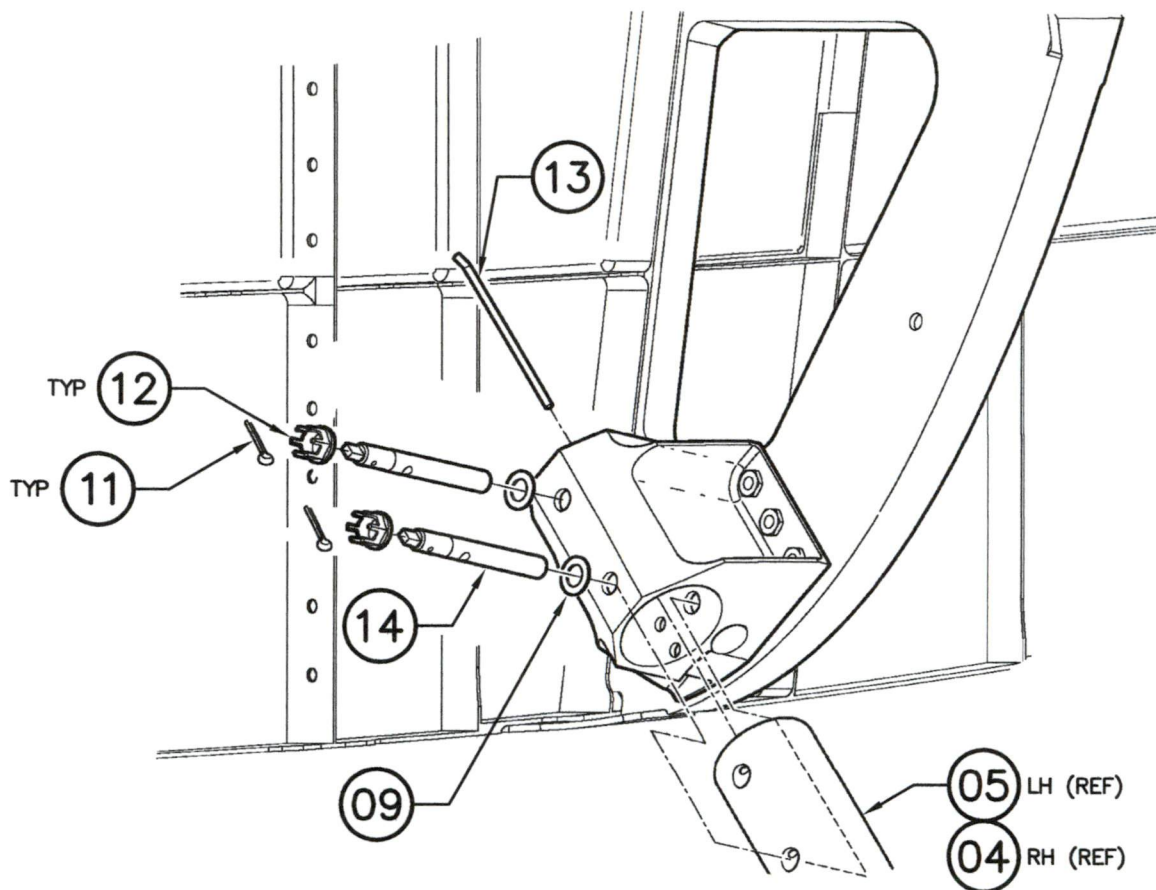


AERO DESIGN LTD.

9888A MALASPINA ROAD
POWELL RIVER, BC, CANADA, V8A 0G3
TEL: 804.483.2376 www.aerodesign.ca

**BELL 429
QUICK RELEASE CARGO BASKET
EXTERNAL ATTACHMENT PROVISIONS INSTALLATION**


SCALE 1 : 1	DWG. SIZE	DWG. NO.	REV.
SHEET 2 OF 4	A4	95907	0



DETAIL D

4	120-205-2	15	SEAL	BELL HELICOPTER		
8	429-706-704-115	14	STUD	BELL HELICOPTER		
4	429-706-074-119	13	SHEAR PIN	BELL HELICOPTER		
8	MS14144L5	12	NUT			
8	MS24665-132	11	COTTER PIN			
4	NAS6605L32	10	BOLT			
12	NAS1149D0532J	09	WASHER			
4	NAS1149D0563J	08	WASHER			
4	MS21042L5	07	NUT			
2	95940-05	06	CENTRE PLUG			
1	95940-04	05	AFT LH LUG			
1	95940-03	04	AFT RH LUG			
1	95940-02	03	FORWARD LH LUG			
1	95940-01	02	FORWARD RH LUG			
1	95907-01	01	EXTERNAL ATTACHMENT PROVISIONS INSTALLATION			
01	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE

QTY LIST OF MATERIALS

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	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON:				
	DECIMALS X.XXX ±0.010 X.XX ±0.03 X.X ±0.1		ANGLES ±1/2°		
	BELL 429 QUICK RELEASE CARGO BASKET EXTERNAL ATTACHMENT PROVISIONS INSTALLATION				
	SCALE 1 : 1 SHEET 3 OF 4		DWG. SIZE A4	DWG. NO. 95907	

REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		

NOTES


1. THIS INSTALLATION IS APPLICABLE TO BELL 429 S/N 57081 AND SUBSEQUENT.
FOR ATTACHMENT PROVISIONS INSTALLATION ON S/N 57080 AND PREVIOUS, REFER TO DRAWING 95902.
2. PASSENGER STEP PROVISIONS 429-706-074-103 (MID) AND 429-706-074-107 (FORWARD AND AFT)
MUST BE INSTALLED PRIOR TO THIS INSTALLATION.
3. CABIN STEP MUST BE REMOVED FROM BOTH SIDES PRIOR TO THIS INSTALLATION. REFER TO MAINTENANCE
MANUAL BHT-429-MM-1, SECTION 32-57. RETAIN HARDWARE FOR USE WITH THIS INSTALLATION AS APPLICABLE.
4. TORQUE 5/16" FASTENERS TO 60-85 INCH-POUNDS (6.8-9.6 Nm).
5. REFER TO INSTRUCTIONS FOR CONTINUED AIRWORTHINESS ICA959.91 FOR DETAILED INSTALLATION INSTRUCTIONS.

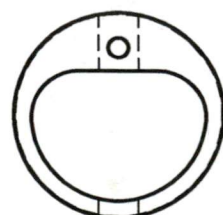
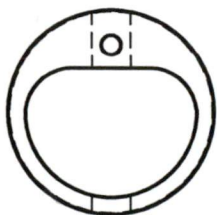
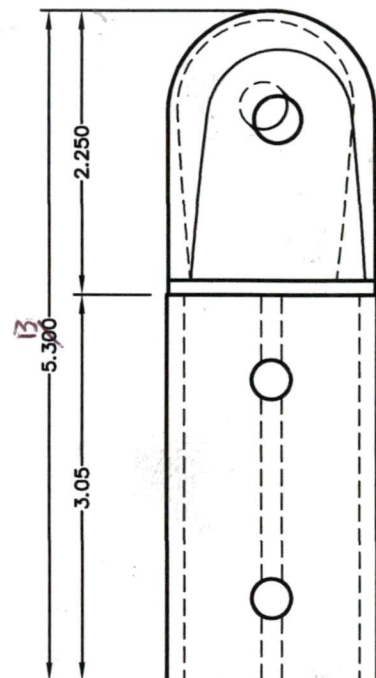
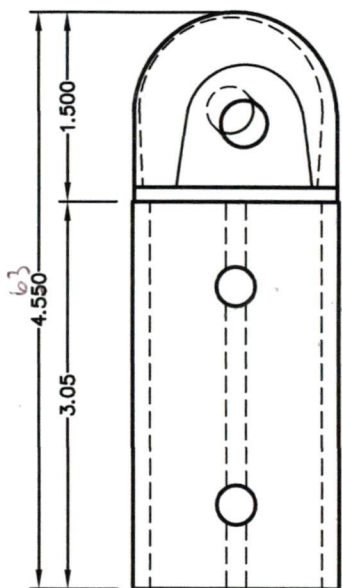
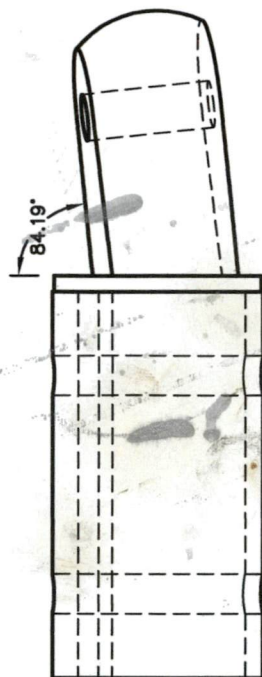
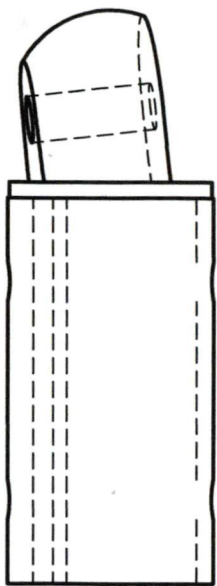
WEIGHT AND BALANCE – METRIC

ITEM	DESCRIPTION	WEIGHT (kg)	LONGITUDINAL		LATERAL	
			ARM (mm)	MOMENT (mm-kg)	ARM (mm)	MOMENT (mm-kg)
06	CENTRE PLUG (RH/LH)	6.62	6060.7	40137	77.0	510
04/05	AFT LUG (RH/LH)	0.18	5111.5	927	726.4	132
02/03	FORWARD LUG (RH/LH)	0.09	5111.5	464	706.1	64
01	EXTERNAL ATTACHMENT PROVISIONS INSTALLATION (TOTAL)	14.15	5117.5	72423	74.0	1047

WEIGHT AND BALANCE – STANDARD

ITEM	DESCRIPTION	WEIGHT (LB)	LONGITUDINAL		LATERAL	
			ARM (IN)	MOMENT (LB-IN)	ARM (IN)	MOMENT (LB-IN)
06	CENTRE PLUG (RH/LH)	14.6	238.61	3483.71	3.03	44.24
04/05	AFT LUG (RH/LH)	0.4	201.24	80.50	28.60	11.44
02/03	FORWARD LUG (RH/LH)	0.2	201.24	40.25	27.80	5.56
01	EXTERNAL ATTACHMENT PROVISIONS INSTALLATION (TOTAL)	31.2	201.47	6286.01	2.91	90.85

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	DRAWN: JEFF CLARKE	25 JAN 2014			
	CHECKED: JASON REKVE				
	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2° X.XX ±0.03 X.X ±0.1		BELL 429 – S/N 57081 & SUB. QUICK RELEASE CARGO BASKET EXTERNAL ATTACHMENT PROVISIONS INSTALLATION		
			SCALE 1 : 1	DWG. SIZE A4	DWG. NO. 95907
		SHEET 4 OF 4			



Jeff Clarke

From: Rousseau, Sebastien [srousseau01@bh.com]

Sent: January 20, 2014 8:26 AM

To: Jeff Clarke

Subject: RE: Bell 429 Cargo Basket

Hi Jeff,

You can ship the fittings as follows:

0 to 150 lbs: FedEx Express air next day- freight collect on our FedEx account 2145-7921-9
150+ Lbs: via ground TST Overland Express / freight collect on our account # 0136670. (6 days transit)

Here is the address:

Bell Helicopter Textron Canada
ATT : Sébastien Rousseau
12800 Rue de l'Avenir
Mirabel, Qc
J7J 1R4, Canada
Tel : 450-971-6500 Ext. 3211

Let me know if you have any questions.

Regards,

SÉBASTIEN ROUSSEAU

Product Support Engineer

Intermediate Group

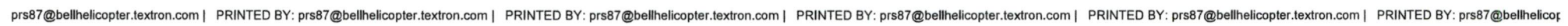
1-800-463-3036 or (450) 437-2077

pseinter@bh.com







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20/01/2014





CONFORMITY INSPECTION RECORD

Applicant Aero Design Ltd.	Aeronautical Product				Title of Change Cargo Basket Installation (959 Configuration)
	Make Bell	Model 429	Serial No.	Registration	
Drawing No. 95940, Rev. 0	Applicant's Inspector Signature Date		T.C. Inspection Signature Date		Findings
95940-01	 21 JAN 14				
95940-02					
95940-03					
95940-04					

APPLICANT'S ATTESTATION

I hereby confirm that the prototype installation for the subject

☒ MODIFICATION,

☐ REPAIR,

☐ TSO/AP-TC ARTICLE

is in conformity with the applicable installation drawing(s) listed above
and that necessary ground tests have been carried out.
[Please check (✓) the applicable box.]

Additional Information:

Parts are not finished (paint/anodize) per drawing

Signature: _____



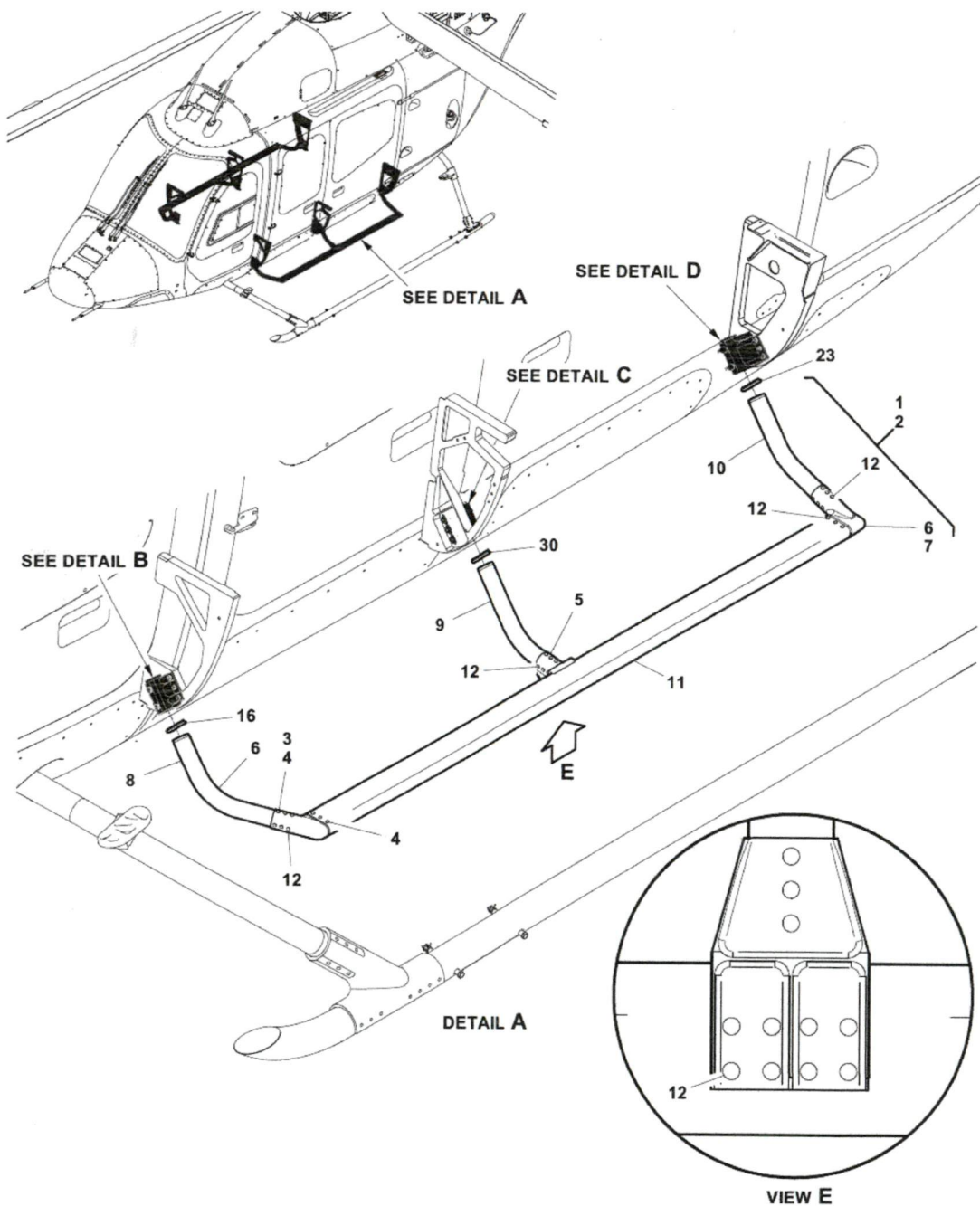
TC INSPECTION

☐ ACCEPTABLE

☐ UNACCEPTABLE

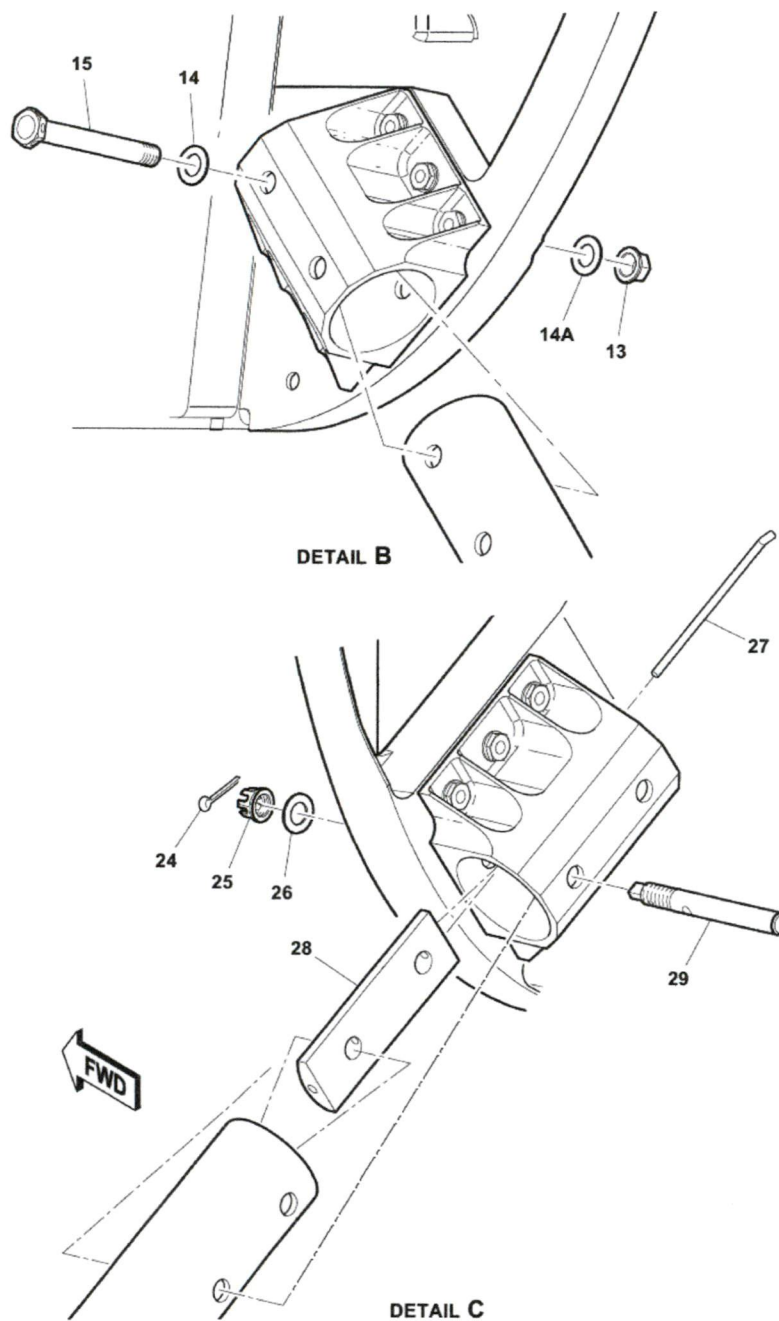
Remarks:

Signature: _____



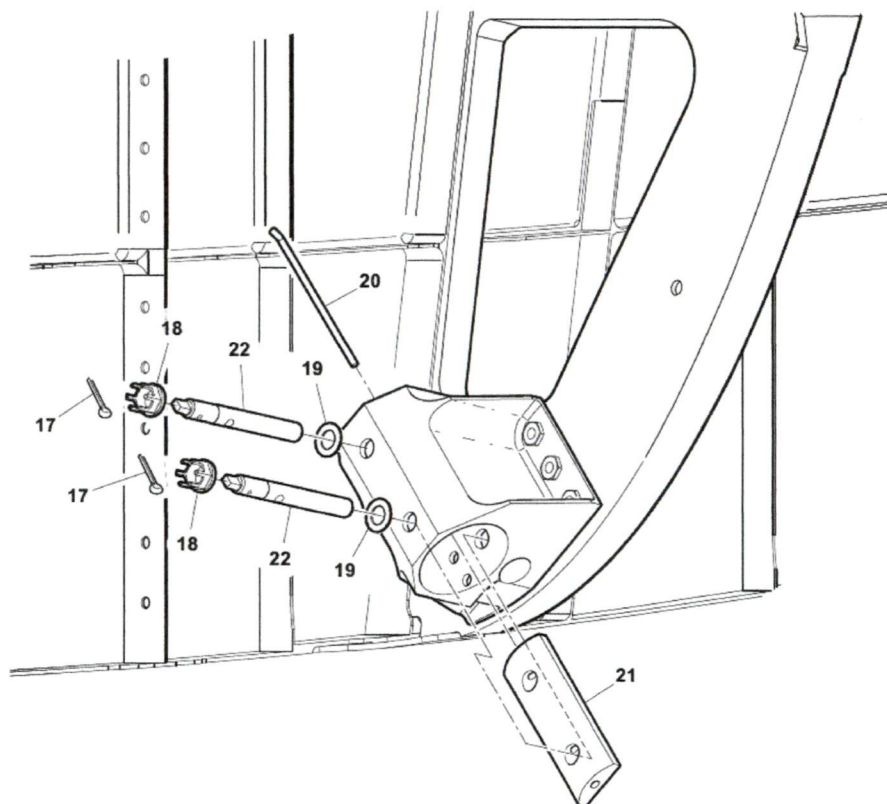
429_IPB_32_0008a

Figure 32-5B. Passenger Step, Full Step Installation (S/N 57081 and Subsequent) (Sheet 1 of 3)



429_IPB_32_0008b_c01

Figure 32-5B. Passenger Step, Full Step Installation (S/N 57081 and Subsequent) (Sheet 2 of 3)



DETAIL D

429_IPB_32_0008c_c01

Figure 32-5B. Passenger Step, Full Step Installation (S/N 57081 and Subsequent) (Sheet 3 of 3)

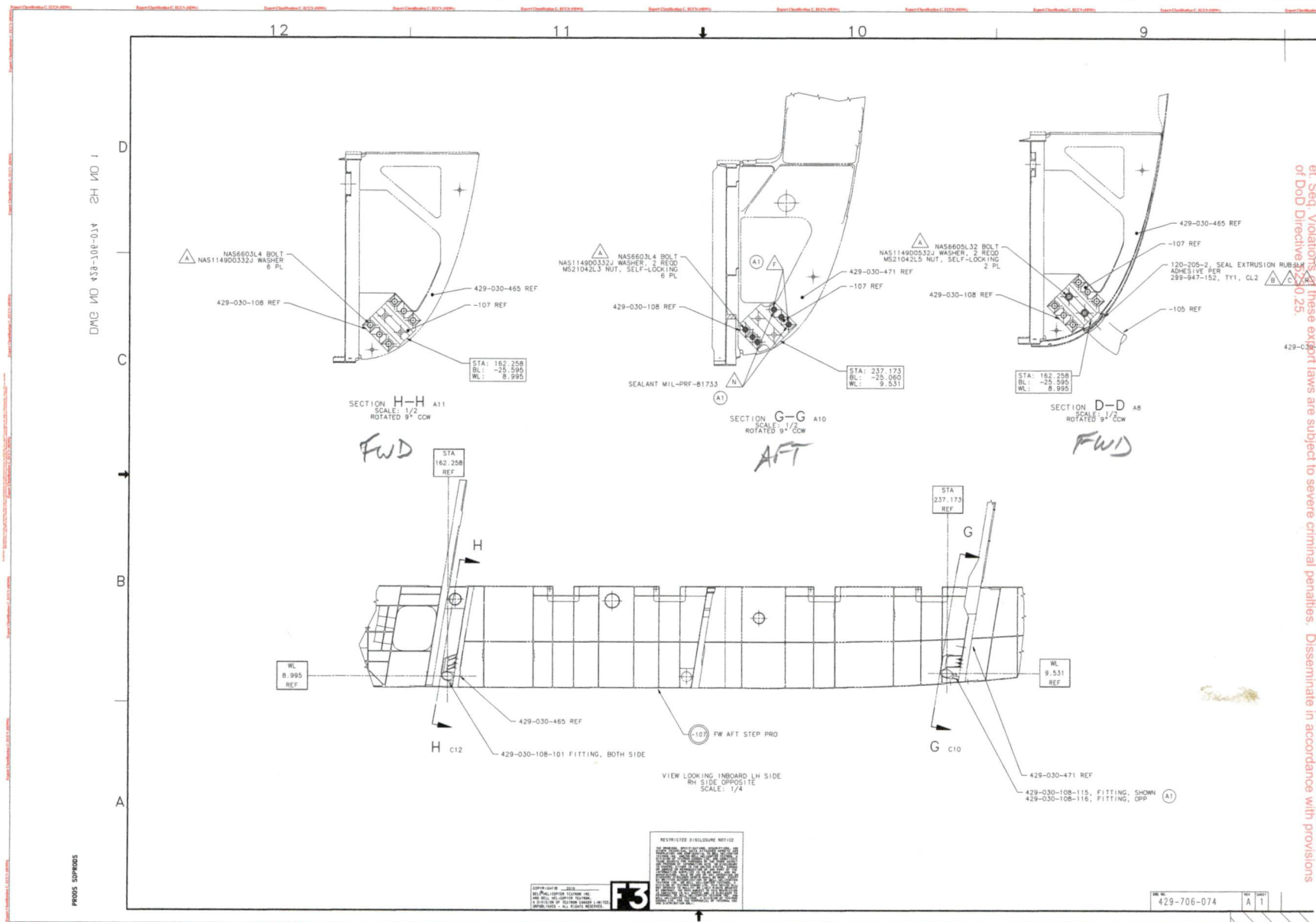
**FIGURE 32-05B: PASSENGER STEP, FULL STEP
INSTALLATION (S/N 57081 AND SUBSEQUENT)**

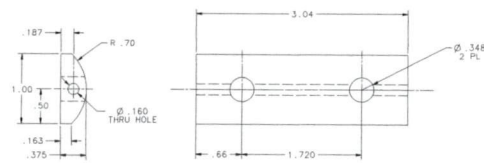
Item	Part Number	Nomenclature	UPA	Avail.	UOC
	429-706-074-105	FULL STEP INSTL	1	P	
1	429-030-136-101	FULL PASSENGER STEP ASSY , LH	1	P	
2	429-030-136-102	FULL PASSENGER STEP ASSY , RH	1	P	
3	429-030-109-101	FITTING TUBE FWD , LH	1		
4	429-030-109-102	FITTING TUBE FWD , RH	1		
5	429-030-109-103	FITTING TUBE MID	1		
6	429-030-109-105	FITTING TUBE AFT , LH	1		
7	429-030-109-106	FITTING TUBE AFT , RH	1		
8	429-030-117-103	TUBE, PASSENGER STEP	1		
9	429-030-117-105	TUBE, PASSENGER STEP	1		
10	429-030-117-107	TUBE, PASSENGER STEP	1		
11	429-030-117-109	TUBE, PASSENGER STEP	1		
12	110-223-05	FASTENER, BLIND	54	NP	
13	MS21042L5	NUT, SELF-LOCKING	2	SP	
14	NAS1149D0532J	WASHER , FLAT	2	P	
14A	NAS1149D0563J	WASHER , FLAT	2	SP	
15	NAS6605L32	BOLT	6	P	
<i>P-Seal</i> 16	120-205-2	SEAL	2	SP	
17	MS24665-132	PIN, COTTER	4	SP	
18	MS14144L5	NUT , SELF-LOCKING	4	SP	
19	NAS1149D0532J	WASHER , FLAT	8	P	
20	429-706-074-119	SHEAR PIN	2	P	
21	429-706-074-117	RADIUS BLOCK	2	P	
22	429-706-074-115	STUD	4	P	
23	120-205-2	SEAL	2	SP	
24	MS24665-132	PIN, COTTER	4	SP	
25	MS14144L5	NUT , SELF-LOCKING	4	SP	
26	NAS1149D0532J	WASHER , FLAT	2	P	

27	429-706-074-119	SHEAR PIN	2	P
28	429-706-074-117	RADIUS BLOCK	2	P
29	429-706-074-115	STUD	4	P
30	120-205-2	SEAL	2	SP

***Availability Code Definition**

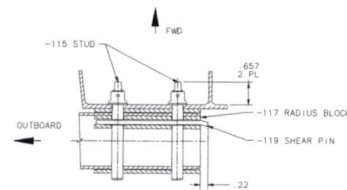
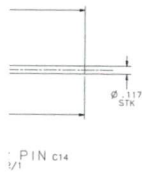
P = Procurable **NP** = Non Procurable **SP** = Normal Stock / Procurable



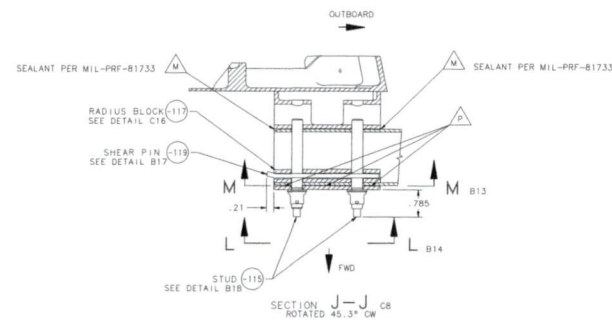


-117 RADIUS BLOCK c14
SCALE: 2/1

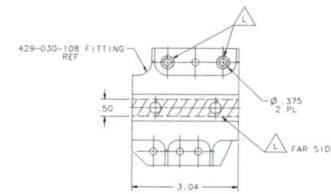
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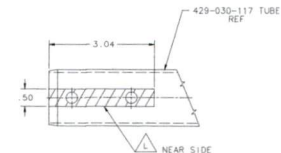
SECTION K-K
ROTATED 45.3° CW



SECTION J-J CB
ROTATED 45.3° CW

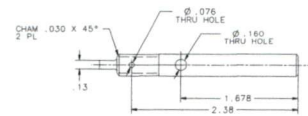
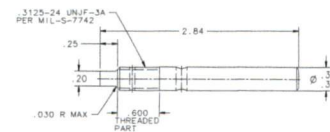


VIEW L-L C14
(SOME DETAILS NOT SHOWN FOR CLARITY)



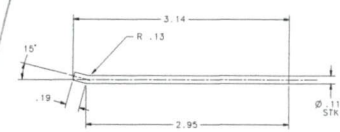
SECTION M-M C14
(SOME DETAILS NOT SHOWN FOR CLARITY)





-115 STUD C14
SCALE: 2/1

17-4 PH → 155-175 ksi
CRES
Precipitation
harden to



-119 SHEAR PIN C14
SCALE: 2/1

MS20253P3-600
hinge pin



Commerce Controlled ECCN # 9E991
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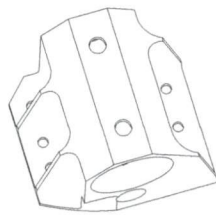
429-706-074 A 2



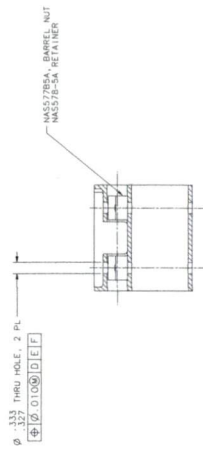
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DME NO 452-020-108 2H NO

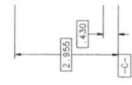
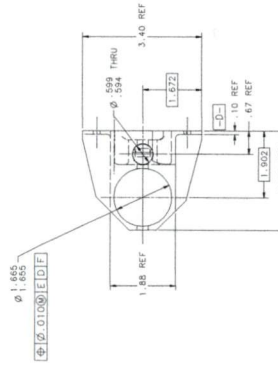
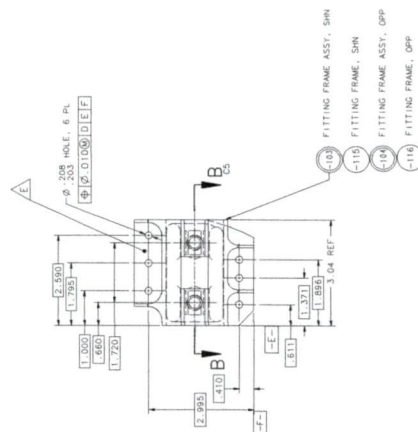
Commerce Controlled ECCN # 9E991
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-115 ISOMETRIC VIEW
SCALE: NONE



SECTION B-B B5



429-030-108

F2

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Export Classification C, ECCN (9E991)

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PARTS LIST	BELL HELICOPTER TEXTRON A SUBSIDIARY OF TEXTRON INC. POST OFFICE BOX 481 - FORT WORTH, TX 76101	CAGE CODE 97499	CONTRACT NUMBER	HEAT TREAT SPEC	NUMBER	REV LTR
			FOR INTERPRETATION SEE 299-947-739	FINISH SPEC 206-947-002	PL429-030-108	
DRAWING TITLE FITTING, ASSY			SWA 3J07YAM	DWG TYPE	SH 1 OF 2	
DRAWN: REVISED BY: DTSWSS: MATERIALS: PRODUCTIVITY: WEIGHTS: TLR/SB: JF VENNIS: D. MAROJLOVIC: S. MARTINEAU: J. QUINN: R. VINCENT: M. BURGE: 10-12-21 10-12-21 10-12-21 10-12-21 10-12-21 10-12-21 10-12-21						
DES/DR: GROUP LEAD: IPT LEAD/CHIEF: CUSTOMER: NMU: H. SULLIVAN: 10-12-21 10-12-21 10-12-21 10-12-21 10-12-21 10-12-21 10-12-21						
THE APPLICATION DATA SHOWN BELOW SUPERSEDES THE APPLICATION DATA ON THE DRAWING						
APPLICATIONS						
DASH NO HEAT ASSY USED ON DASH NO HEAT ASSY USED ON DASH NO HEAT ASSY USED ON -101 429-708-074 429M -101 429-708-074 429M -104 429-708-074 429M						
LTR DESCRIPTION DATE LTR DESCRIPTION DATE LTR DESCRIPTION DATE						
- ORIG RELEASED 11-01-06						
LTR LTR NOTE						
A BREAK ALL SHARP EDGES .015 X 45 DEGREES OR .015 R. B REMOVE STAMP PART NUMBER PER SP94050. C FINAL HEAT TREAT CONDITION MUST BE AS SPECIFIED FOR STARTING MATERIAL. D PRESENTLY INSPECT PER SP94050. E CHECK HARDNESS PER SP94467 ON INDICATED SURFACE. HARDNESS SHALL BE RB #2 MIN. F CHECK CONDUCTIVITY PER SP94453. G UN-DIMENSIONED FEATURES ARE DEFINED BY CATIA MODEL 429-030-108-101, -115, -116 AND SHALL BE CONSIDERED BASIC UNLESS OTHERWISE SPECIFIED. H 1 THICKNESS TOLERANCE TO BE +/- .003 FOR ALL FEATURES LESS THAN .200. J 1 PROFILE TOLERANCE OF ALL SURFACES TO BE .020 RELATIVE TO DATUMS A PRIMARY, B SECONDARY AND C TERTIARY FOR -101; AND D PRIMARY, E SECONDARY AND F TERTIARY FOR -115 & -116 UNLESS OTHERWISE SPECIFIED.						
DASH NO NOMENCLATURE THICKNESS/SHAPE STOCK SIZE TMS 1000 PSI OR COND MATERIAL SPECIFICATION						
-101 FITTING 3.0000 3.100 3.5 T7451 T7451 7050 AL ALY AMS4050						
-115 FITTING 3.0000 3.100 3.5 T7451 T7451 7050 AL ALY AMS4050						
-116 FITTING 3.0000 3.100 3.5 T7451 T7451 7050 AL ALY AMS4050						

Export Classification C, ECCN (9E991)

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Export Classification C, ECCN (9E991)

Export Classification C, ECCN (9E991)

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PARTS LIST	BELL HELICOPTER TEXTRON A SUBSIDIARY OF TEXTRON INC. POST OFFICE BOX 481 - FORT WORTH, TX 76101	CAGE CODE 97499	CONTRACT NUMBER	HEAT TREAT SPEC	NUMBER	REV LTR
			FOR INTERPRETATION SEE 299-947-739	FINISH SPEC 206-947-002	PL429-030-108	
DRAWING TITLE FITTING, ASSY			SWA 3J07YAM	DWG TYPE	SH 1 OF 2	
PARTS LIST						
RV *** QUANTITY FOR ASSEMBLY ***						
LR -104 -103 PART NUMBER NOMENCLATURE QPAK PS T T FROM TRNG CODE FINISH C T SH SNE DI						
-101 FITTING K XPG1 C 1 B2						
-103 FITTING ASSY A 1 A5						
-104 FITTING ASSY D 1 A5						
-115 FITTING K XPG1 D 1 A5						
-116 FITTING STD STD STD STD STD STD						
1 2 2 KAS57785A NUT BARREL						
2 2 KAS578-5A RETAINER						
*** END OF REPORT ***						

Export Classification C, ECCN (9E991)

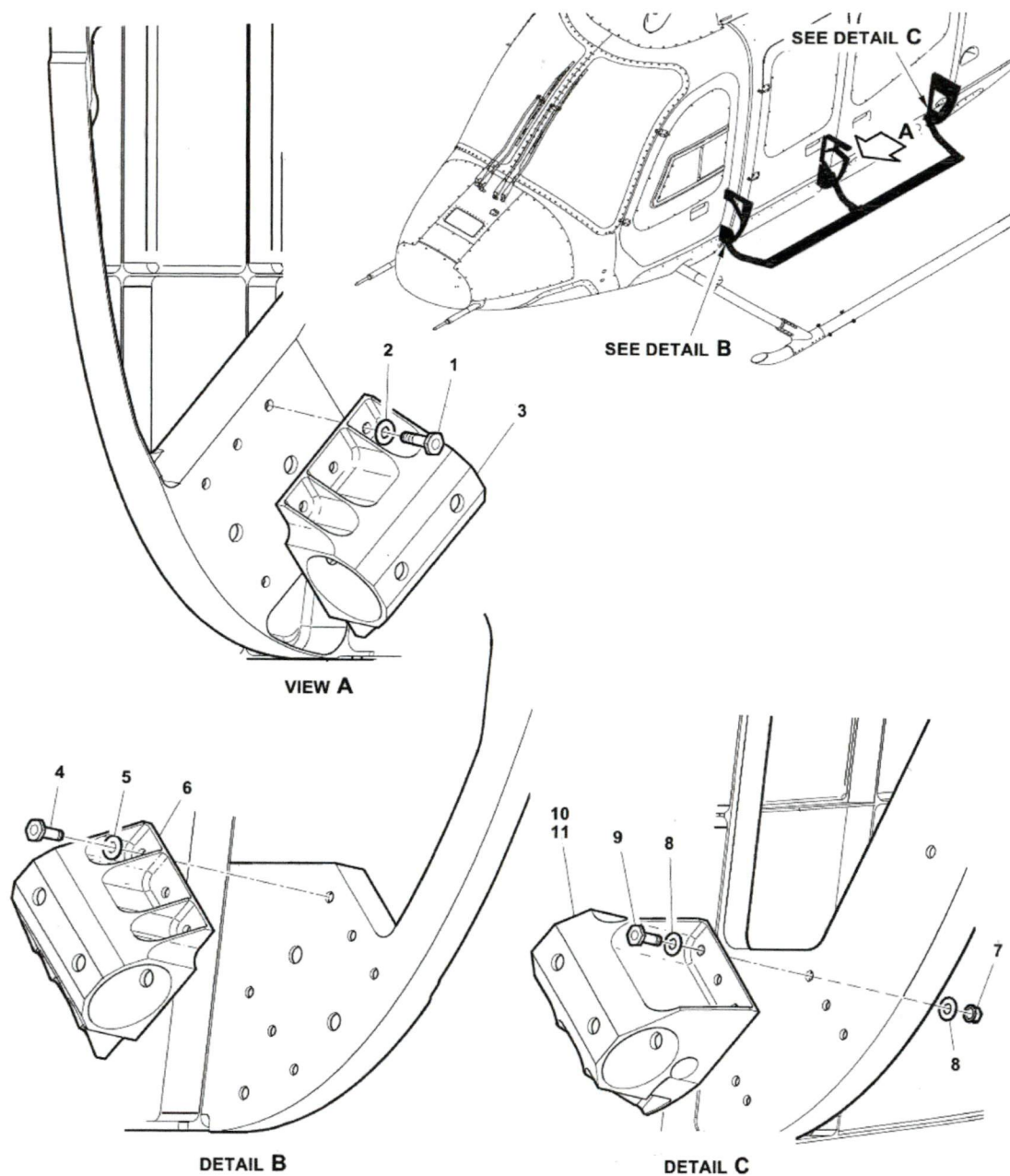
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			FOR INTERPRETATION SEE 299-947-739		FINISH SPEC 206-947-002		
DRAWING TITLE TUBE , PAX STEP			EWA 3J07YAM		DWG TYPE	SH 1 OF 2	
DRAWN: E. BULA 10-09-23		REVIEWED BY: G. POWELL 11-02-07	STRESS: S. MARTINEAU 11-01-24	MATERIALS: S. CAMPELLONE 11-01-24	PRODUCIBILITY: R. VINCENT 11-01-25	WEIGHTS: M. BURGE 11-01-24	ILS/SE:
DER/DE: WC FAESSLER 11-02-04		GROUP LEAD: P. PARADIS 11-01-26	IPT LEAD/CHIEF: L. ALBERT 11-02-11	CUSTOMER:	EMU: D. GUILBAULT 11-01-27		
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-101	429-030-134	429M	-103	429-030-136	429M	-105	429-030-136
-107	429-030-136	429M	-109	429-030-136	429M		
----- PL REVISION RECORD -----							
LTR	DESCRIPTION	DATE	LTR	DESCRIPTION	DATE	LTR	DESCRIPTION
-	ORIG RELEASE	11-02-18	A	429AB1547	11-06-20		
----- PL NOTES -----							
LTR LINE NOTE							
A	BREAK ALL SHARP EDGES .015 X 45 DEGREES OR .015 R.						
B	RUBBER STAMP PART NUMBER PER BPS4050.						
C	PARTS REQUIRE IN-PROCESS HEAT TREAT VERIFICATION TESTS. TEST MATERIAL SHALL BE FROM THE SAME						
2	MILL HEAT AS THE PARTS IT REPRESENTS AND SHALL BE THE SAME THICKNESS AS THE PARTS AT TIME OF						
3	HEAT TREATMENT. TEST MATERIAL TO BE CUT FROM ONE TUBE SECTION PER HEAT TREAT LOT AND						
4	FLATTENED PRIOR TO HEAT TREATMENT. THE FINAL REQUIRED DIMENSIONS OF THE FLATTENED TEST MATERIAL						
5	ARE MINIMUM 1/2" WIDE BY 4" LONG (PER ASTM B557). TEST COUPON MUST ACCOMPANY PARTS THROUGH HEAT						
6	TREATMENT. AFTER HEAT TREATMENT, THE TEST MATERIAL IS TO BE TESTED FOR T73 LOT ACCEPTANCE PER						
7	BPS4139.						
D	PENETRANT INSPECT PER BPS4089.						
E	1 MAINTAIN THE TOLERANCES SHOWN FOR THE DIMENSIONED LENGTH.						
F	1 CHECK HARDNESS PER BPS4467 ON INDICATED SURFACE. HARDNESS SHALL BE RB 85MIN OR ROCKWELL 15T						
2	88.5 MIN. ALTERNATIVELY, CONDUCTIVITY INSPECTION CAN BE DONE PER BPS4453.						
----- PART NUMBER MATERIAL REQUIREMENTS -----							
DASH	NOMENCLATURE	THICKNESS/SHAPE	STOCK SIZE	*****	TNSL 1000 PSI OR COND	*****	MATERIAL *****
NO			WIDTH/WALL LENGTH	INITIAL	FINAL	TYPE	NAME SPECIFICATION
-101	TUBE, PAX STEP	1.6250 DIA	.125WALL 18.2	O	T73	7075	AL ALY WW-T-700/7, TY I OR AMS-WW-T-700/7, TY I

USE OR DISCLOSURE OF DATA CONTAINED ON THIS SHEET IS SUBJECT TO THE RESTRICTION ON THE DRAWING

PARTS LIST	BELL HELICOPTER TEXTRON A SUBSIDIARY OF TEXTRON INC. POST OFFICE BOX 482 - FORT WORTH, TX 76101	CAGE CODE 97499	CONTRACT NUMBER	HEAT TREAT SPEC	NUMBER	REV LTR
			FOR INTERPRETATION SEE 299-947-739	FINISH SPEC 206-947-002	PL429-030-117	A
DRAWING TITLE TUBE , PAX STEP			EWA 3J07YAM	DWG TYPE	SH 2 OF 2	
----- PART NUMBER MATERIAL REQUIREMENTS -----						
DASH NO	NOMENCLATURE	***** THICKNESS/SHAPE	STOCK SIZE WIDTH/WALL LENGTH	***** TNSL 1000 PSI OR COND INITIAL FINAL	***** MATERIAL NAME SPECIFICATION	
-103	TUBE, PAX STEP	1.6250 DIA	.083WALL 14.2 O	T73	7075 AL ALY	WW-T-700/7, TY I OR AMS-WW-T-700/7, TY I
-105	TUBE, PAX STEP	1.6250 DIA	.083WALL 12.8 O	T73	7075 AL ALY	WW-T-700/7, TY I OR AMS-WW-T-700/7, TY I
-107	TUBE, PAX STEP	1.6250 DIA	.083WALL 13.0 O	T73	7075 AL ALY	WW-T-700/7, TY I OR AMS-WW-T-700/7, TY I
-109	TUBE, PAX STEP	2.6250 DIA	.049WALL 67.5 O	T62	7075 AL ALY	WW-T-700/7, TY I OR AMS-WW-T-700/7, TY I
----- PARTS LIST -----						
RV *** QUANTITY PER ASSEMBLY ***				P B R C S E	EFFECTIVITY CAGE FINISH	C
LR	PART NUMBER	NOMENCLATURE	GFAE FS T T	FROM THRU CODE	CHEM ORG NOTE	T SH ZNE DI
	-101	TUBE, PAX STEP			K XPD1 C	D 1 B1
	-103	TUBE, PAX STEP			K XPD1 C	D 1 C3
	-105	TUBE, PAX STEP			K XPD1 C	D 1 C5
	-107	TUBE, PAX STEP			K XPD1 C	D 1 C7
	-109	TUBE, PAX STEP			K XPD1 E	D 1 A6
----- END PARTS LIST -----						
* * * E N D O F R E P O R T * * *						



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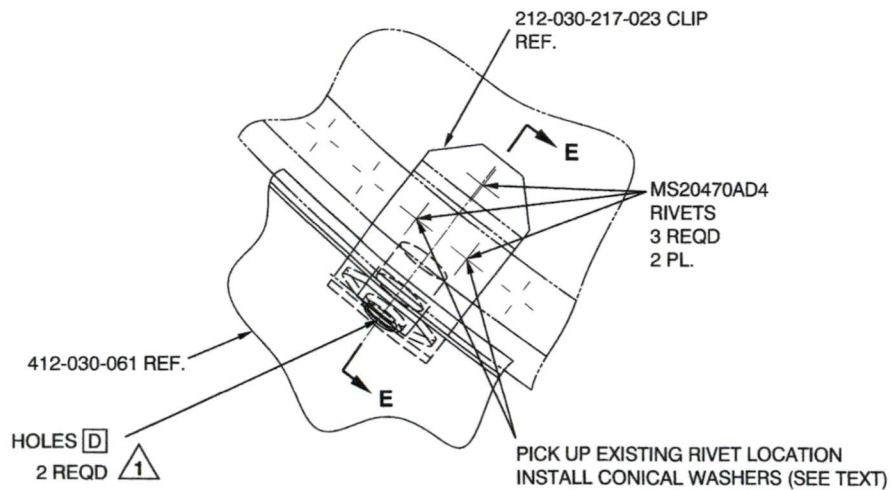
Figure 32-5A. Passenger Step, Provisions (S/N 57081 and Subsequent)

FIGURE 32-05A: PASSENGER STEP, PROVISIONS (S/N 57081 AND SUBSEQUENT)

Item	Part Number	Nomenclature	UPA	Avail.	UOC
	429-706-074-103	PASSENGER STEP, PROVISIONS, MID	1	P	
1	NAS6603L5	BOLT	12	P	
2	NAS1149D0332J	WASHER, FLAT	12	SP	
3	429-030-108-101	FITTING	2	P	
	429-706-074-107	PASSENGER STEP, PROVISIONS, FWD, AFT	1	P	
4	NAS6603L4	BOLT	12	P	
5	NAS1149D0332J	WASHER, FLAT	12	SP	
6	429-030-108-101	FITTING , FWD	2	P	
7	MS21042L3	NUT, SELF-LOCKING	12	SP	
8	NAS1149D0332J	WASHER, FLAT	24	SP	
9	NAS6603L4	BOLT	12	P	
10	429-030-108-115	FITTING , AFT, LH	1	P	
11	429-030-108-116	FITTING , AFT, RH	1	P	

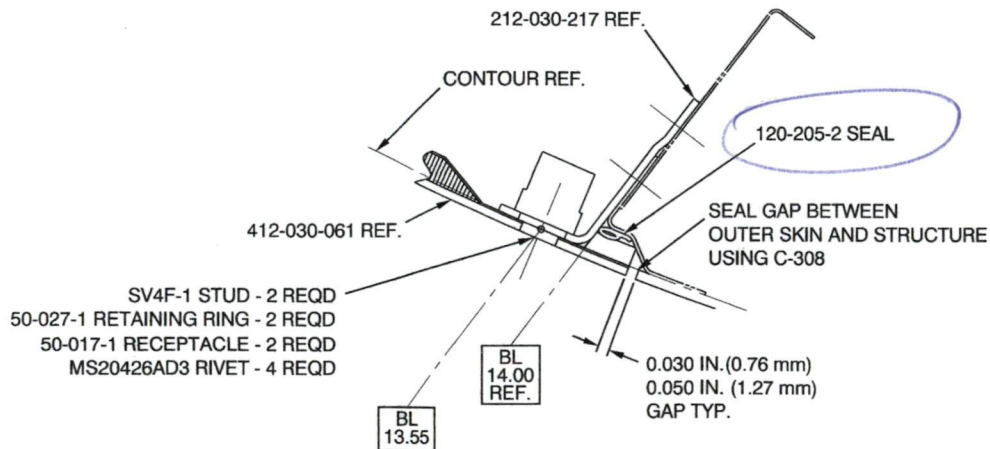
***Availability Code Definition**

P = Procurable **NP** = Non Procurable **SP** = Normal Stock / Procurable



VIEW D

VIEW LOOKING INBD
RH SIDE



SECTION E-E

FIGURE 1 (SHEET 3 OF 4)
LOWER NOSE DOOR MODIFICATION

3. Install seal P/N 120-205-2 on the nose structure around the upper and lower nose door opening using adhesive (C-300). Refer to Figure 1, Sheet 3.
4. Apply a light bead of sealant (C-308) around the nose door opening to seal the gap between the outer skin, the structure and the seal. Refer to Figure 1, Sheet 3. Allow sealant to cure for 24 hours.
5. Install upper nose door. Reinstall lower nose door (or refer to Part A, if replacing the door).
6. Close and latch nose doors, and verify for watertightness. Correct, if required.
7. Refinish as required.
8. Make helicopter ready for flight.
9. Make an entry in helicopter historical records indicating compliance with this technical bulletin.